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NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Charah, Inc. - Green Meadows

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Michael Plummer, P.E. Phone: 704-338-6843

E-mail: Michael.Plummer@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Brickhaven No. 2 Mine Tract "A"	1271 Moncure-Flatwood Road Chatham County Moncure, North Carolina	1910-STRUCT-2015	CAMA	October 15-16 & 19,2015 & November 18-20, 2015

Environmental Status: (Check all that apply)

☒ Initial/Background Monitoring ☐ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Michael Plummer, P.E. | Project Manager | 704-338-6843

Facility Representative Name (Print) | Title | (Area Code) Telephone Number

Signature | 12/31/2015 Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 12/31/15

HDR Engineering, Inc. of the Carolinas; 440 S. Church St., Suite 1000; Charlotte, NC 28202

Facility Representative Address

F0116

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

2015 Semi-Annual Groundwater, Surface Water and Leachate Sampling Report

Brickhaven No.2 Mine Tract “A” Structural Fill

Charah, Inc.

Moncure, Chatham County, North Carolina

December 31, 2015

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List of Acronyms

µg/L	micrograms per liter
asl	above sea level
CAMA	North Carolina Coal Ash Management Act of 2014
CCP	Coal Combustion Products
EPA	United States Environmental Protection Agency
ft/ft	feet / foot
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCGPS	North Carolina groundwater protection standard
NTU	Nephelometric turbidity units
PVC	polyvinyl chloride
TDS	total dissolved solids
USGS	U.S. Geological Survey

1 Introduction

1.1 Purpose

This *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* addresses results from the first, second, and third of eight required sampling events at the Brickhaven No.2 Mine Tract "A" Structural Fill site in Moncure, Chatham County, North Carolina..

Groundwater monitoring and sampling prior to, during, and post-disposal of coal combustion products (CCPs) into the previously clay mined pits of the site shall be conducted in accordance with the following:

- Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729, ratified by North Carolina General Assembly)
- Water Quality Monitoring Plan Brickhaven No.2 Mine Tract "A" Structural Fill, approved March 2015.
- North Carolina Department of Environmental Quality (NCDEQ)[1]Permit No. 1910-STRUC-2015, issued June 5, 2015.
- NCDEQ Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling, April 2008.
- NCDEQ Division of Water Management memorandum concerning electronic document submittal for routine groundwater and surface water monitoring, November 5, 2014.
- U.S. Environmental Protection Agency (EPA) Region I, *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*, January 19, 2010.

Per the approved permits and water quality monitoring plan, a minimum of eight groundwater monitoring events will be conducted at site over the course of one year, concluding on or about August 2016. A minimum of one independent background sample prior to placement of ash was specified in the permit (**Appendix A**).

The first sampling event occurred on August 12, 2015 and was addressed in detail in the *Initial Background Groundwater and Surface Water Monitoring Event Report* prepared by Buxton Environmental, Inc. (Buxton) on October 28, 2015. A copy of the report is provided in **Appendix B**. The second and third sampling events commenced on October 15, 2015 and November 18, 2015, respectively. The first and second sampling events occurred prior to the placement of ash on October 23, 2015 and represent pre-existing site conditions.

1.2 Regulatory Background

CAMA Section §130A-309.216 requires implementation of a groundwater monitoring system as described in the requirements as follows:

[1] Prior to September 18, 2015, the NCDEQ was referred to as the North Carolina Department of Environment and Natural Resources (NCDENR). Both naming conventions are used in this report, as appropriate.

"§ 130A-309.216. Design, construction, and siting requirements for projects using coal combustion products for structural fill.

(b) Liners, Leachate Collection System, Cap, and Groundwater Monitoring System Required for Large Structural Fills. –

(4) A groundwater monitoring system, that shall be approved by the Department and, at a minimum, consists of all of the following:

a. A sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the relevant point of compliance as approved by the Department. A down-gradient monitoring system shall be installed at the relevant point of compliance so as to ensure detection of groundwater contamination in the uppermost aquifer.

b. A proposed monitoring plan, which shall be certified by a licensed geologist or professional engineer to be effective in providing early detection of any release of hazardous constituents from any point in a structural fill or leachate surface impoundment to the uppermost aquifer, so as to be protective of public health, safety, and welfare; the environment; and natural resources.

c. A groundwater monitoring program, which shall include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and down-gradient wells. Monitoring shall be conducted through construction and the post-closure care period. The sampling procedures and frequency shall be protective of public health, safety, and welfare; the environment; and natural resources.

d. A detection monitoring program for all Appendix I constituents. For purposes of this subdivision, the term "Appendix I" means Appendix I to 40 C.F.R. Part 258, "Appendix I Constituents for Detection Monitoring," including subsequent amendments and editions.

e. An assessment monitoring program and corrective action plan if one or more of the constituents listed in Appendix I is detected in exceedance of a groundwater protection standard

On April 17, 2015, EPA published its final rule *Disposal of Coal Combustion Residuals from Electric Utilities* to regulate the disposal of CCP as solid waste under Subtitle D of the Resource Conservation and Recovery Act. Among other requirements, the final rule established requirements for a groundwater monitoring program consisting of detection monitoring and, if necessary, assessment monitoring and corrective action. EPA selected constituents for detection monitoring that are present in CCP, would be expected to migrate rapidly, and would thereby provide early detection as to whether contaminants were migrating from the disposal unit (80 FR 74: 21397).

As stated in the Federal Register (80 FR 74: 21342)

> *These detection monitoring constituents or inorganic indicator parameters are: boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS). These inorganic indicator parameters are known to be leading indicators of releases of contaminants associated with CCR and the Agency strongly recommends that State Directors add these constituents to the list of indicator parameters to be monitored during detection monitoring of groundwater if and when a MSWLF decides to accept CCR.*

Groundwater analytical results for the constituents in 40 CFR 257, Appendix III detection monitoring and 40 CFR 257, Appendix IV assessment monitoring are included below.

Constituents for detection monitoring listed in 40 CFR 257 Appendix III are:

- Boron
- Calcium
- Chloride
- Fluoride
- pH
- Sulfate
- Total dissolved solids (TDS)

Constituents for assessment monitoring listed in 40 CFR 257 Appendix IV include:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

Aluminum, copper, iron, manganese, and sulfide were included in the Appendix IV constituents in the draft rule; EPA removed these constituents in the final rule. Therefore, these constituents are not included.

1.2.1 Site Specific Regulatory Background

In accordance with CAMA, the *Water Quality Monitoring Plan* (Buxton, 2015a) for the site was designed to effectively provide early detection of any release, as to be protective of human health and the environment. The *Design Hydrogeologic Report* (HDR, 2014*)* specified a groundwater monitoring network would comprised of seven downgradient/side-gradient monitoring wells and one upgradient background well. Four pre-existing piezometers (PZM-1, PZM-22, PZM-27, and PZM-28) were to be converted to monitoring wells (MW-4, MW-5, MW-7, and MW-8, respectively); PZM-28 remained dry during investigations and was unable to be utilized for monitoring well MW-8 as originally specified. PZM-28 was subsequently abandoned in accordance with North Carolina standards and its abandonment was documented in the *Report of Abandonment of Piezometer PZM-28,* submitted to NCDEQ on October 5, 2015. Therefore, only MW-4, MW-5, and MW-7 were successfully converted to monitoring wells during the August through December 2015 time period (**Table 1** and **Appendix C**).

Four downgradient/side-gradient compliance wells (MW-2, MW-3, MW-6, and MW-8 replacement) and one upgradient background well (MW-1) were installed from June 19 through July 30, 2015. On July 17, 2015, Mr. Ross Klingman, P.G. with Buxton, contacted Ms. Elizabeth Werner, Permitting Hydrogeologist with NCDEQ SWS, via telephone to request the installation of an additional background monitoring well (BG-1). The additional background well would assist with current background and future semi-annual groundwater quality monitoring at the site. During the conversation, Ms. Werner verbally approved the installation of the additional background monitoring well (Buxton, 2015b).

1.3 Site Location, Operation and Background

The site is located in Chatham County, approximately four miles southwest of central Moncure, North Carolina (**Figure 1**). The owner of the site is Green Meadow, LLC (Green Meadow) and Charah, Inc. (Charah) is responsible for the operation and maintenance of the site. The mine property is approximately 301 acres in total; the structural fill area for CCP placement comprises approximately 145 acres; and the fill area including associated perimeter berms, channels, and haul roads encompasses 166 acres. The remaining acreage is still utilized for clay mining activities.

The property located within the structural fill area was previously owned by General Shale Brick, Inc., which operated the site as a clay mine since 1985 for their off-site brick manufacturing facility. Mined clay was stockpiled and then transported approximately 3.5 miles south to Brickhaven, North Carolina for brick manufacturing.

The area immediately surrounding the site primarily consists of rural residential (approximately 2,500 feet east, 1,000 feet southeast and 1,000 feet southwest), commercial, industrial, wooded and agricultural property. According to information obtained from the Chatham County GIS website, municipal water supply is available to the surrounding area.

Charah began CCP placement in the first composite liner containment system (Cell 1A) on October 23, 2015. Based on the plan to place approximately 1,600,000 tons of CCP per year in a 10,000,000 cubic yard structural fill capacity; therefore, the placement phase should last

approximately eight years. CCPs (including fly ash, bottom ash, boiler slag, and/or flue gas desulfurization materials) are brought to the site by truck, rail, or combination thereof, from the Duke Energy Carolinas (DEC) Riverbend Steam Station and Duke Energy Progress (DEP) L.V. Sutton Energy Complex (Sutton Plant) sites. CCPs could eventually be brought to the site from other DEC and/or DEP sites.

Leachate (i.e. product generated from the liquids present in the fill at the time of placement and/or stormwater that infiltrates the fill) is managed on-site through collection, storage, treatment, and disposal of the resultant liquid. Leachate discharge is appropriately permitted and is properly disposed of at a wastewater treatment plant. A leachate sample was collected during the November 18 (i.e., 3rd round) sampling event; analytical leachate results are discussed in Section 3.1.3.

1.4 Site Topography and Geographical Setting

According to the 1993 USGS topographic quadrangle (**Figure 2**), the topography of the site and immediately surrounding area can be characterized by moderately rolling hills, which are dissected by dendritic creeks. The northwestern portion of the site generally slopes to the north and northwest from three topographic high ridges with interconnected saddles ranging from approximately 260 to 270 feet above sea level (asl), towards off-site intermittent tributary creeks. The southeastern portion of the site generally slopes to the southeast, south and west from the three topographic high ridges with similar interconnected saddles ranging from approximately 260 to 270 feet asl, towards on-site intermittent tributary creeks that drain from the southern property boundary at approximately 205 feet asl.

1.5 Geologic and Hydrogeologic Setting

1.5.1 Regional Geology

The site is located within the Piedmont physiographical province of North Carolina, which is a northeast-southwest trending region extending from New York to Alabama.

, According to the 1985 North Carolina Geologic Map prepared by the North Carolina Geological Survey, the site is located in the Triassic Basin Belt of the Piedmont physiographic province. The basement rocks of the Triassic Basin Belt include conglomerate, sandstone, mudstone, limestone, coal, and shale. The majority of the subject property is located within the Sanford Formation which contains conglomerate, fanglomerate, sandstone, and mudstone. The far western portion of the site is located in the Cummock Formation which contains sandstone, mudstone, gray and black coal, and carbonaceous shale. The Triassic Basin is bounded by felsic metavolcanic rock within the Carolina Slate Belt approximately 6.5 miles to the northwest; and is contacted by metamorphosed granite and by biotite gneiss and schist of the Raleigh Belt along a normal fault approximately 2.5 miles to the southeast. The Triassic Basin formations have been intruded by north northwest-south southeast trending igneous diabase dikes during the Jurassic Period (~144 to 208 Ma), and contain northeast-southwest trending normal faults, however, none of these were indicated to exist at the subject site on the 1985 geologic map (NCDENR, 1985).

In the Piedmont, the bedrock is typically overlain by a mantle of weathered rock (residuum/saprolite), which has an average thickness of approximately 25 feet. The residuum/saprolite consists of varying amounts of unconsolidated clays, silts and sands, with lesser amounts of rock fragments. Due to the range of the parent rock composition and the variable susceptibility to weathering of each rock type, the residuum/saprolite ranges widely in color, texture and thickness. Generally, the residuum/saprolite is thickest near inter-stream divides (ridges) and thins toward stream beds. In profile, the residuum/saprolite normally grades from clayey soils near the land surface to sandier, partially weathered rock above the competent bedrock (Buxton, 2014).

1.5.2 Site Geologic Units

The geology of the site can be subdivided into six lithologic units, which include fill, flood plain, soil horizon, residuum, partially weathered rock, and layered rock. These geologic units generally grade downward from a soil horizon, to residuum, to partially weathered rock and finally layered rock. The fill materials were only identified in the road bed and berm located around the east and west sides of the site. The flood plain sediments were only identified on the southeast corner of the site.

1.5.2.1 FILL

The fill materials were only identified in the road bed and berm located around the southeast corner of the site. The fill material generally consisted of mottled reddish yellow, orange, brown, and light gray; sandy silty clay with quartz and brick gravel.

1.5.2.2 FLOOD PLAIN

The flood plain sediments were only identified on the southeast corner of the site. The flood plain sediments were associated with the former adjacent intermittent tributary creek. The flood plain sediments can generally be characterized by a mottled light gray; fine sandy silty clay. The flood plain sediments were approximately five feet thick at this corner and had been deposited above residuum. Based on geotechnical laboratory data, the flood plain sediments consisted of USCS group symbol CL.

1.5.2.3 SOIL HORIZON

The soil horizon can generally be characterized by mottled yellowish, brown, orange and red color consisting of silty clay and clayey silt. Vegetative root structures were common. The soil horizon at the site is formed from the continued weathering and biologic reworking of residuum, and ranges from two to 15 feet in thickness when present. Based on geotechnical laboratory data, the soil horizon consisted of USCS group symbols SC, MH and CL, and had approximate hydraulic conductivity value of 2.86×10^{-7} cm/sec (Buxton, 2014).

1.5.2.4 RESIDUUM

Residuum at the site can generally be characterized by a red and reddish brown color with black and gray mottles, primarily consisting of sandy silty clay with infrequent quartz gravel and cobbles. The residuum often contained a horizontal fissile characteristic (breaks in horizontal sheets). The residuum generally retains the remnant texture, structure and mineral content of the rock from which it was formed, and ranges from five to 15 feet in thickness. The residuum has a standard penetration resistance of less than 100 blows per foot. Based on geotechnical

laboratory data, the residuum consisted of USCS group symbol CL. Approximate hydraulic conductivity values ranged from 7.69 x 10^{-8} cm/sec to 3.69 x 10^{-9} cm/sec, according to geotechnical laboratory data (Buxton, 2014).

1.5.2.5 PARTIALLY WEATHERED ROCK

The partially weathered rock can generally be characterized by a brown, reddish gray and weak red color with light green and purple mottles and stingers, primarily consisting of silty clay and weathered mudstone, which often contain horizontal fissile characteristics. The partially weathered rock generally retains the remnant texture, structure and mineral content of the rock from which it was formed, and ranges from five to 40 feet in thickness. Partially weathered rock has a standard penetration resistance of 100 blows per foot or greater and can generally be drilled with standard hollow-stem auger drilling technology. Based on geotechnical laboratory data, the partially weathered rock consisted of USCS group symbol CL. Approximate hydraulic conductivity values ranged from 2.433 x 10^{-4} cm/sec to 7.154 x 10^{-8} cm/sec, according slug or recovery test data (for wells screened solely in partially weathered rock) (**Appendix D**).

1.5.2.6 LAYERED ROCK

Based on rock coring activities conducted at the site and visual inspection of the layered rock exposed on the north side of the site, layered rock at the site is primarily composed of reddish to light tan gray mudstone, cross-bedded muddy sandstone, and muddy sandy conglomerate (rounded quartz gravel and cobbles). The layered rock generally exists in horizontally oriented and relatively thin intermittent layers (especially within the upper 15 feet of contacting layered rock) across the site based on rock coring and the horizontal fissile nature of residuum and partially weathered rock. The layered rock contains horizontal to near vertical fracturing. Large fractures, oriented approximately N 40° to 60° E at 70° northwest, were observed in weathered mudstone. Rock quality designation values for the rock core (21-inch recovery) were poor (47.6%). The occurrence of layered rock at the site was generally defined by auger refusal.

1.5.3 Regional Hydrogeology

The occurrence and movement of groundwater in the Piedmont physiographic province is within two separate but interconnected water-bearing zones that typically comprise one aquifer. A shallow water-bearing zone occurs within the residuum/saprolite and a deeper zone within the underlying bedrock.

Groundwater in the residuum/saprolite zone occurs in the interstitial pore spaces between the individual grains comprising the residuum/saprolite. Groundwater in this zone is typically under water table conditions and generally flows from topographic highs to topographic lows. The occurrence and movement of groundwater in the underlying bedrock zone is controlled by joints and fractures within the bedrock. Groundwater within this deeper zone may occur under confined or semi-confined conditions, depending on the extent of fracturing at the saprolite/bedrock interface. Deeper groundwater movement is typically controlled by the distribution of openings in the bedrock and can be variable.

No naturally occurring springs or creeks with actively flowing water recharged by the subsurface aquifer were observed within the site boundary during this reporting period.

2 Sampling Procedures

2.1 Groundwater Sampling Procedures

A total of eight monitoring wells, one background well, and two surface water samples were collected on three separate occasions in 2015 (**Figure 3**). The initial/first and second monitoring events (August 12, 2015 and October 15, 2015 respectively) occurred prior to the placement of ash at the site on October 23, 2015 and therefore constitute pre-existing site conditions. The third monitoring event (November 18, 2015) occurred after the placement of CCP. A single leachate sample was collected during the third monitoring event. The first monitoring event was conducted by Buxton; the second and third by Pace Analytical Services, Inc. Analytical laboratory results for the three monitoring events are provided in **Appendices B, E, and F**.

Prior to commencing groundwater sampling, new plastic sheeting was placed around the well head, in order to prevent the sampling equipment from contacting the ground surface. The well lock was then removed from the protective stand-up-cover. New nitrile gloves were donned and static groundwater levels were obtained from below the measuring point (top-of-well polyvinyl chloride (PVC) casing) at each monitoring well to the nearest 0.01 foot with a depth-to-water electrode at each well. Low flow purging and sampling was conducted utilizing a stainless-steel Proactive SS and Mega Monsoon pump with flow rate controller, which was plumbed to new polyethylene sample tubing (1/2-inch outer diameter (OD) 3/8-inch inner diameter (ID)). In the event of low recharge a peristaltic pump was utilized to purge and sample the well. The base of the pump was set at approximately two feet off the bottom depth above the well base to reduce turbidity. The following information was recorded at timed intervals during the purging process: 1) water levels below top of casing, 2) purge flow rate, 3) purge rate and cumulative water pumped, and 4) field parameters. Temperature, conductivity, pH, oxygen reduction potential , and dissolved oxygen were recorded with a Horiba U-52 meter; and turbidity was recorded with a Micro-TPW meter. The Horiba U-52 and Micro-TPW meters were rented and calibrated by Enviro-Equipment, Inc. of Pineville, North Carolina for the first monitoring event. Horiba U-52 and Micro-TPW/LaMotte turbidity meters, property of Pace Analytical, were calibrated prior to use and on-site during the second and third monitoring events.

Purging was conducted until a minimum of three well bore volumes of water had been removed and the below field parameters requirements have been met and stabilized. All measurements, except turbidity, must be obtained using a flow-through-cell, while turbidity measurements are obtained before water enters the flow-through-cell.

- Turbidity (10% for values greater than 5 NTU (if three turbidity values are less than 5 NTU, the values are considered stabilized)
- Dissolved oxygen (10% for values greater than 0.5 mg/L, if three dissolved oxygen values are less than 0.5 mg/L, the values are considered stabilized)
- Specific conductance (3%)
- Temperature (3%)
- pH ($\pm$ 0.1 unit)

- Oxidation reduction potential ($\pm$ 10 millivolts)

If field parameters had stabilized prior to purging three well bore volumes, or the well was going dry, groundwater samples were then collected. The water level meter and low flow pump were decontaminated in the field with a distilled water rinse, Alconox® wash, and a distilled water rinse, prior to and following sampling at each monitoring well. Following sampling, locks were placed back on the well stand-up covers. Purge water was discharged to the ground surface at respective well heads.

All samples were shipped under proper management and Chain of Custody (COC) procedures to Pace Analytical Services, Inc. laboratory in Huntersville, North Carolina (Cert IDs #37706 and #5342). Sample handling and custody was performed according to the EPA Guidance for Field Samplers.

2.2 Surface Water Sampling Procedures

Surface water samples were collected from two locations outside of the structural fill boundary to provide for potential surface water-groundwater interactions and evaluation of potential off-site impacts. The SW-1 sampling location is downgradient of the site, approximately 3,000 feet south of the structural fill boundary along an unnamed tributary of Gulf Creek. The SW-2 sampling location is upgradient of the site, approximately 3,200 feet west of the structural fill boundary along Shaddox Creek. Approximate surface water sampling locations are depicted on **Figure 4**.

New nitrile gloves were donned prior to collecting surface water samples. Field parameters (including temperature, conductivity, pH, oxygen reduction potential, and dissolved oxygen) were recorded with a Horiba U-52 meter; turbidity was recorded with a Micro-TPW meter.

Gulf Creek and Shaddox Creek are classified as Class WS-IV Waters by NCDEQ and as such are evaluated under North Carolina Surface Water and Wetland Standards (15A NCAC 02B).

3 Results

Groundwater analytical results for the constituents in 40 CFR 257 Appendix III detection monitoring and 40 CFR 257 Appendix IV assessment monitoring (as previously discussed in **Section 1.2)** were compared to background concentrations to determine if any impact to groundwater is indicated. If any impact to groundwater is inferred from groundwater detection monitoring or if a potential impact is detected, Charah must notify NCDEQ of any exceedance(s) within 14 days. In the event no exceedances are observed, Charah must submit a report of the sampling results to NCDEQ with 120 days of the sampling event.

Groundwater samples were also analyzed for constituents of assessment monitoring (EPA 40 CFR 257 Appendix IV). Assessment monitoring typically occurs if a statistically significant increase in a detection monitoring constituent is noted and will be further assessed in subsequent reporting. Appendix IV constituents were analyzed for background events and will continue to be assessed during future monitoring events. Groundwater monitoring samples

were also analyzed for 40 CFR Part 258 Appendix I metals and volatile organic compounds (VOCs).

Iron and manganese, two constituents often attributable to weathering of Piedmont parent material, were not analyzed during testing.

A summary of the laboratory parameters detected during the first three monitoring events, along with the highest detected concentration result, is provided in the sections below. Full laboratory data is provide in Appendices E, F, and G.

3.1 Groundwater Analytical Results

3.1.1 Background Site Conditions

Pre-CCP Placement groundwater site conditions (i.e. laboratory analysis from the first and second monitoring events, i.e. 1st and 2nd Round) generally exhibited high background chloride and total dissolved solids (TDS) content. According to a United States Geologic Survey (USGS) paper entitled *Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan* (USGS, 2004), chloride occurs naturally in some sedimentary rock layers (particularly shale; as is present at the subject site). The chloride is commonly associated with seawater (i.e. saline water) present at the time of rock formation. Based on this information, the chloride detected above North Carolina groundwater protection standards (NCGPS) at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-7 and MW-8 appears to be the result of naturally occurring conditions (**Figure 3**). In addition, the TDS detected above NCGPS at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-6, MW-7, and MW-8 appears to be the result of naturally occurring conditions, since elevated natural chloride levels would contribute to elevated TDS. Data packages can be seen in **Appendix B and Appendix E**.

Several monitoring wells additionally showed exceedances of NC 2L Standards for antimony, barium, chromium, cobalt, copper, and vanadium. These exceedances were generally restricted to the second monitoring event; quality control blanks (e.g. trip blank, field blank, and equipment blank) for the second event did not exhibit detections for these constituents.

Ranges of constituent concentrations for pre-existing groundwater conditions are summarized below. The monitoring well location of the highest concentration for a given constituent is provided in parentheses.

EPA Appendix III Constituent Detections (Pre-Existing Site Conditions)

- Boron: 6.1 to 98 µg/L (MW-7)
- Calcium: 16,900 to 185,000 µg/L (MW-3)
- Chloride: 22,000 to 1,160,000 µg/L (MW-3)
- Fluoride: <20 to 740 µg/L (MW-5)
- pH: 6.17 to 7.89 SU
- Sulfate: 3,700 to 199,000 µg/L (MW-2)
- Total Dissolved Solids: 230,000 to 2,770,000 µg/L (MW-3)

EPA Appendix IV Constituent Detections (Pre-Existing Site Conditions)

- Antimony: <0.17 to 12 µg/L (MW-3)

- Arsenic: <2.5 to 6.7 µg/L (MW-3)
- Barium: 100 to 1,240 µg/L (MW-8)
- Beryllium: <0.12 to 0.19J µg/L (MW-4)
- Cadmium: <0.044 to 0.18 µg/L (MW-7)
- Chromium: <0.63 to 33.9 µg/L (MW-8)
- Cobalt: <2.5 to 7.6 µg/L (MW-4)
- Lead: <2.5 to 6.3 µg/L (MW-5)
- Lithium: 7.18J to 70.4 µg/L (MW-3)
- Mercury: 0.028 to 0.075J µg/L (BG-1)
- Molybdenum: <0.51 to 20.6 µg/L (MW-2)
- Selenium: <5.0 to 15 µg/L (MW-3)
- Thallium: <0.075 to <5.0 (non-detect for all wells for all three monitoring events)
- Radium-226: 0.077J to 1.33 pCi/L (MW-2)
- Radium-228: 0.023J to 1.39 pCi/L (MW-2)

EPA Appendix I Metal Detections (Pre-Existing Site Conditions)

- Copper: <2.5 to 16.4 µg/L (MW-5)
- Nickel: <2.5 to 18.2 µg/L (MW-8)
- Silver: <0.17 to 1.6 µg/L (MW-8)
- Vanadium: <2.5 to 9.9 µg/L (MW-5)
- Zinc: <5.0 to 106 µg/L (MW-5)

EPA Appendix I VOC Detections (Pre-Existing Site Conditions)

- 1,4-Dichlorobenzene: <0.19 to 0.19J µg/L (MW-2)
- Acetone: <0.16 to 1.8J µg/L (MW-3)
- Bromodichloromethane: <0.23 to 4 µg/L (MW-2)
- Bromoform: <0.35 to 1.4 µg/L (MW-2)
- Carbon Disulfide: <0.45 to 0.93J µg/L (MW-5)
- Chloroform: <0.21 to 4.5 µg/L (MW-2)
- Dibromochloromethane: <0.23 to 4.4 µg/L (MW-7)
- Dibromethane: 0.26 to 0.31J µg/L (MW-7)

On July 6, 2015, Buxton conducted the development of monitoring wells MW-2, MW-3 and MW-7 and introduced an approximately five gallons of municipal tap water obtained from a Charlotte Water source, in order to enhance development of these slow recharging wells. On September 10, 2015, Buxton conducted additional development of monitoring wells MW-2, MW-3 and MW-7 (Buxton 2015b). On October 26, 2015, Mr. Klingman contacted the Charlotte Water - Vest Water Treatment Plant Control Room (704-336-2100), in order to determine their disinfection process. A Charlotte Water employee indicated the municipal water is disinfected with chlorine gas. Based on this information, the bromodichloromethane and dibromochloromethane detected above NCGPS in groundwater samples from MW-2, MW-3, and MW-7 appear to be the result of municipal water utilized during previous development activities. These trihalomethanes were only detected in the first sampling event; all VOCs were non-detect for the second and third sampling events. VOCs are not present at naturally occurring background concentrations at the site.

3.1.2 Conditions Following CCP Placement

CCP placement began at the site on October 23, 2015; one monitoring event (3rd Round) has been conducted following CCP placement. Monitoring wells and the background well continued to show elevated chloride and TDS, although the concentration and frequency of exceedances dropped between the second and third monitoring events. The decrease in TDS may be due to the settling of well conditions or further well development. Antimony, barium, and pH additionally showed several exceedances as seen in the first and second monitoring events, although there were significantly fewer of such cases for the third monitoring event. The intermittent chromium, cobalt, copper, and vanadium exceedances detected in the first and second monitoring events were not present in the third monitoring event. Naturally occurring metals exceeding NCGPS are common in North Carolina due to weathering of crystalline parent material.

pH levels detected below NCGPS in groundwater samples at BG-1 (6.24 to 6.44 SU) and MW-4 (6.17 to 6.35 SU) for all three monitoring events and appear to be the result of naturally occurring conditions.

Ranges of constituent concentrations for initial groundwater conditions following CCP placement are summarized below. The monitoring well location of the highest concentration for a given constituent is provided in parentheses. Data packages can be seen in **Appendix F**.

EPA Appendix III Constituent Detections (Post-CCP Placement Site Conditions)

- Boron: 5.9 to 49.4 µg/L (MW-7)
- Calcium: 12,400 to 194,000 µg/L (MW-8)
- Chloride: 21,700 to 1,230,000 µg/L (MW-3)
- Fluoride: <20 to 590 µg/L (MW-5)
- pH: 6.30 to 7.60 SU
- Sulfate: 3,100 to 238,000 µg/L (MW-2)
- Total Dissolved Solids: 230,000 to 652,000 µg/L (BG-1)

EPA Appendix IV Constituent Detections (Post-CCP Placement Site Conditions)

- Antimony: <3.8 to 10.1 µg/L (MW-3, MW-8)
- Arsenic: <2.50 µg/L in all wells for third monitoring event
- Barium: 93.2 to 1,550 µg/L (MW-8)
- Beryllium: <0.5 µg/L in all wells for third monitoring event
- Cadmium: <0.5 µg/L in all wells for third monitoring event
- Chromium: <2.50 µg/L to 7.2 µg/L (MW-2)
- Cobalt: <2.50 µg/L in all wells for third monitoring event Lead: <2.50 µg/L in all wells for third monitoring event
- Lithium: <0.11 µg/L to 128 µg/L (MW-3)
- Mercury: <0.10 µg/L in all wells for third monitoring event
- Molybdenum: <2.50 µg/L to 21.1 µg/L (MW-2)
- Selenium: <5.0 µg/L in all wells for third monitoring event
- Thallium: <5.0 µg/L in all wells for third monitoring event
- Radium-226: 0.0638J to 1.16 pCi/L (MW-8)
- Radium-228: 0.174J to 1.95J pCi/L (MW-3)

EPA Appendix I Metal Detections (Post-CCP Placement Site Conditions)

- Copper: <2.5 µg/L in all wells for third monitoring event

- Nickel: <2.5 µg/L to 7.2 (MW-7)
- Silver: <2.5 µg/L in all wells for third monitoring event
- Vanadium: <2.5 µg/L in all wells for third monitoring event Zinc: <5.0 µg/L to 50.7 (MW-2)

EPA Appendix I VOC Detections (Post-CCP Placement Site Conditions)

- 1,4-Dichlorobenzene: <0.33 µg/L in all wells for third monitoring event
- Acetone: <10.0 µg/L in all wells for third monitoring event
- Bromodichloromethane: <0.18 µg/L in all wells for third monitoring event
- Bromoform: <0.26 µg/L in all wells for third monitoring event
- Carbon Disulfide: <1.20 µg/L in all wells for third monitoring event
- Chloroform: <0.14 µg/L in all wells for third monitoring event
- Dibromochloromethane: <0.21 µg/L in all wells for third monitoring event
- Dibromomethane: <0.21 µg/L in all wells for third monitoring event

3.2 Surface Water Analytical Results

Surface water samples prior to and following CCP placement had very few constituents above established North Carolina Surface Water and Wetland Standards (15A NCAC 02B) or EPA National Criteria standards (utilized by North Carolina Division of Water Quality as default standards for non listed parameters) . The first surface water sampling event had no exceedances; the second surface water sampling event had one exceedance of copper in SW-1 and one exceedance of cobalt in SW-2. Following CCP placement at the site, no exceedances were detected in either SW-1 or SW-2. Detections and exceedances observed thus far at SW-1 and SW-2 are likely naturally-occurring.

3.3 Leachate Analytical Results

Leachate generated on-site was collected during the third monitoring event to geochemically characterize the nature of CCP leachate (**Figure 5**). The leachate sample generally displayed lower constituent concentrations than groundwater or surface water collected during the same monitoring event. All Appendix III constituents, with the exception of fluoride, were detected in the leachate sample; barium, lithium, radium-226, radium-228, and zinc were additionally detected. No exceedances of NCGPS were detected in the leachate sample.

3.4 Groundwater Flow Characteristics

During slug testing conducted in September 2015, depth-to-water was established for the seven monitoring wells, one upgradient well, and one background well. Depths-to-water ranged from 7.8 feet below top of casing (MW-6) to 60.04 feet below top of casing (btoc) (MW-1). Groundwater elevations ranged from 191.78 msl (MW-2) to 232.01 msl (MW-5).

3.4.1 Groundwater Direction

Groundwater generally flows toward the southeastern portion of the site, although radial flow away from two topographic high points is depicted on **Figure 6**. A potentiometric surface map for groundwater elevations measured during slug testing is shown in **Table 2** and **Figure 6**.

3.4.2 Hydraulic Conductivity

Hydraulic conductivity is the capacity of a porous medium to transmit water (K, coefficient of

permeability). This property is primarily dependent upon the size, shape, and interconnectedness of pores, and is governed secondarily by the properties of the fluid (i.e., viscosity, a temperature-dependent phenomenon). Horizontal hydraulic conductivity of aquifer materials opposite the well screen was estimated through in-situ slug testing. On September 10, 2015, Buxton conducted rising head slug tests at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8, in order to determine hydraulic conductivity (Buxton, 2015b). Results are provided in **Table 3** and **Appendix D**.

Prior to conducting slug tests, static water levels were obtained at each well to the nearest one-hundredth of a foot (0.01 feet) with an electronic water level indicator. Slug tests were conducted by lowering one or two disposable PVC bailer(s) attached to new nylon rope below the water level at each well. Water levels were allowed to equilibrate to near static conditions (at least 90% recharge). A slug of water was then removed from the well by withdrawing the bailer(s) and water levels were measured with time.

The slug and recovery test data were evaluated using AQTESOLV® software developed by Hydrosolv, Inc. (2007) and in accordance with the methods developed by Bouwer and Rice in 1976 and 1987. The Bouwer-Rice method utilized to evaluate the slug test data was developed to determine the hydraulic conductivity of the aquifer immediately surrounding the screened portion of the partially or fully penetrating wells in unconfined aquifers.

Monitoring wells were generally screened within residuum or partially weathered rock; hydraulic conductivity ranged from 4.08E-07 cm/sec (0.422 ft/year) to 4.11E-04 (425.5 ft/year).

3.4.3 Hydraulic Gradients

Horizontal hydraulic gradient is calculated by taking the difference in hydraulic head over the length of the flow path between two wells of similar construction. BG-1, MW-1, MW-2, MW-3, and MW-6 were installed with 15-foot screens, while MW-4, MW-5, and MW-7 (i.e. converted piezometers) were installed with ten-foot screens. Hydraulic gradients at the site ranged from 0.0001 between MW-6 and MW-7 to 0.02 between MW-4 and MW-5 (**Table 4**).

3.4.4 Groundwater Flow Velocity

Darcy's Law is an equation that describes the flow rate or flux of fluid through a porous media. To calculate the velocity that moves through a porous media, the specific discharge, or Darcy flux, is divided by the effective porosity, P_e. The result is the average linear velocity, or seepage velocity, of groundwater between two points.

The following equation was used to calculate groundwater velocities between specific wells.

$$V_S = \frac{Ki}{P_e}$$

Where:

V_s = seepage velocity
K = horizontal hydraulic conductivity
i = horizontal hydraulic gradient
P_e = effective porosity

Seepage velocities for groundwater were calculated using horizontal hydraulic gradients established in Section 3.2.3, horizontal hydraulic conductivity values established in Section 3.2.2, and estimated effective porosity values from geotechnical testing and from the literature where geotechnical data was not available. (Buxton, 2014; Sinhal and Gupta, 2010). If geotechnical data was unavailable, an effective porosity of 0.15 was used for wells primarily screened in residuum/PWR and an effective porosity of 0.075 was used for wells primarily screened in layered rock/PWR.

Flow velocity varies with hydraulic conductivity as well as hydraulic gradient and effective porosity of the soil, and therefore this approximated value varies on a well-by-well basis. Throughout the study area, flow velocity ranged from 0.05 feet per year (between MW-6 and MW-7) to approximately 63 feet per year (between MW-1 and MW-2). The site average flow velocity is approximately eight feet per year for the evaluated screen intervals. Flow velocity values are summarized in **Table 5**.

4 Conclusions

The first three of eight monitoring events were conducted at Brickhaven No. 2 Mine Tract “A” Structural Fill site from August to November, 2015. The first and second monitoring events were conducted prior to the placement of CCP on October 23, 2015, and therefore represent pre-existing site conditions. The requisite one minimum independent background monitoring event specified in Permit No. 1910-STRUC-2015 has thus been met. The third monitoring event was conducted after CCP placement and therefore represents initial post-CCP placement conditions at the site.

A summary of the findings from the first three events is provided below and in **Table 6s**:

- Groundwater samples collected at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8 indicated the presence of constituents above established NCGPS.
- Chloride exceeded its NCGPS in seven of nine wells for the first monitoring event and six of nine wells for the second and third monitoring events. Chloride is likely naturally occurring due to site geological conditions.
- TDS exceeded the NCGPS in eight of nine wells for the first monitoring event, seven of nine wells for the second monitoring event, and two of nine wells for the third monitoring event. TDS concentrations are likely naturally occurring throughout the site and appear to be decreasing in concentration and frequency of exceedances.
- Groundwater pH was exceeded in BG-1 and MW-4 for all three monitoring events. Low pH at these two wells is likely naturally occurring.
- Bromodichloromethane and dibromochloromethane were exceeded in three monitoring wells during the first monitoring event; chloroform and carbon disulfide were additionally detected during the first monitoring event. These constituents are likely the result of municipal water utilized during previous development activities. All VOCs were non-detect for the second and third sampling events; therefore, VOCs are not present at naturally-occurring background concentrations at the site.

- Antimony, barium, chromium, cobalt, and vanadium exhibited multiple exceedances in different wells during all three monitoring events, although the second monitoring event presented the greatest frequency and variety of exceeded constituents. These constituents are likely naturally occurring.
- Analytical data from the third monitoring event indicated placement of CCP has not impacted groundwater at the site.
- Surface water collected at two off-site locations exhibited no exceedances during the first or third monitoring events, and two exceedances during the second monitoring event. Exceedances during the second monitoring event are likely naturally occurring. Analytical data from the third monitoring event indicated surface water has not been impacted by the placement of CCP at the site.
- The single leachate sample collected during the third monitoring event generally displayed lower constituent concentrations than groundwater or surface water collected during the same monitoring event. All Appendix III constituents, with the exception of fluoride, were detected in the leachate sample; barium, lithium, radium-226, radium-228, and zinc were additionally detected. No exceedances of NCGPSs were detected in the leachate sample.
- Groundwater was encountered at the Site from 7.8 feet (MW-6) to 60.04 feet below top of casing (MW-1); water table elevations ranged from 191.78 msl (MW-2) to 232.01 msl (MW-5). Groundwater flow throughout the site followed a subdued version of the topography, flowing from topographic highs to topographic lows.

5 Recommendations

Based on the findings of this assessment, HDR makes the following recommendations:

- Background groundwater and surface water sampling should continue to be conducted on an approximate 45-day frequency until all eight (8) independent background sampling events have been completed.
- The fourth monitoring event should occur on January 4, 2016, and should include groundwater, surface water, and leachate sampling.

6 References

Buxton Environmental. 2015a. *Water Quality Monitoring Plan for Brickhaven No.2 Mine Tract “A” Structural Fill.*

Buxton Environmental. 2015b. *Compliance Groundwater Well Installation, Development, Surveying and Hydraulic Conductivity Determination Activities Report for Brickhaven No.2 Mine Tract “A” Structural Fill.*

HDR. 2014. *Permit Application for Brickhaven No.2 Mine Tract “A” Structural Fill including Design Hydrogeological Report.*

North Carolina Department of Natural Resources and Community Development. 1985. *North Carolina Geologic Map.*

North Carolina General Assembly. *Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729).* Ratified.

NCDEQ. 2008. *Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling.*

Singhal, B. B.S. and R. P. Gupta. 2010*. Applied Hydrogeology of Fractured Rocks: Springer, 2nd Edition*, 408p. (Table 8-1, p. 140)

United States Geological Survey. 2004. *Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan.*

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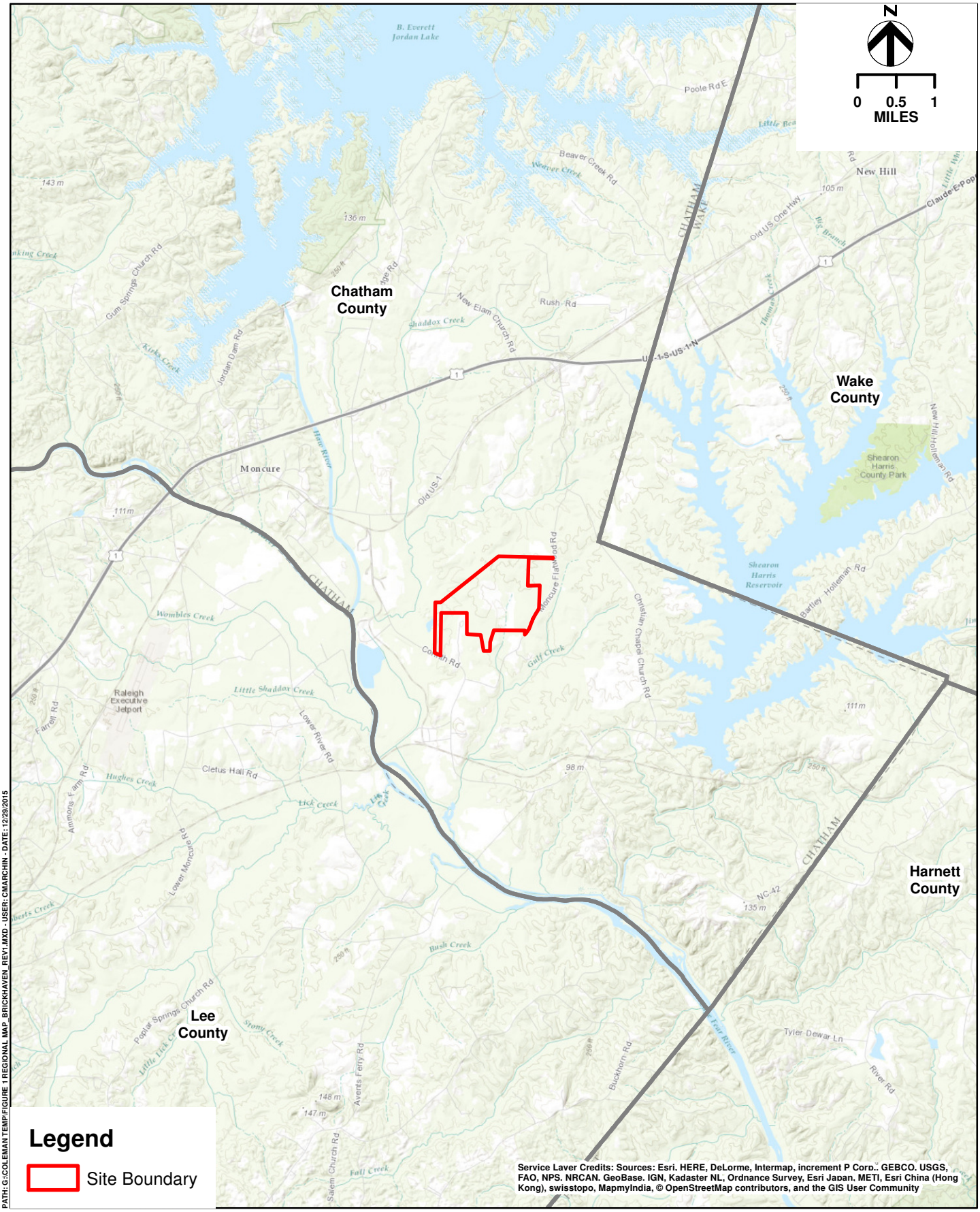
Figures

Figure 1: Regional Site Location Map
Figure 2: Regional USGS Topographic Map
Figure 3: Site Layout Map with Monitoring Wells Locations
Figure 4: Surface Water Sample Location Map
Figure 5: Leachate Sample Location
Figure 6: Potentiometric Surface Map



PATH: G:\COLEMAN TEMP\FIGURE 1 REGIONAL MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 12/29/2015

REGIONAL SITE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

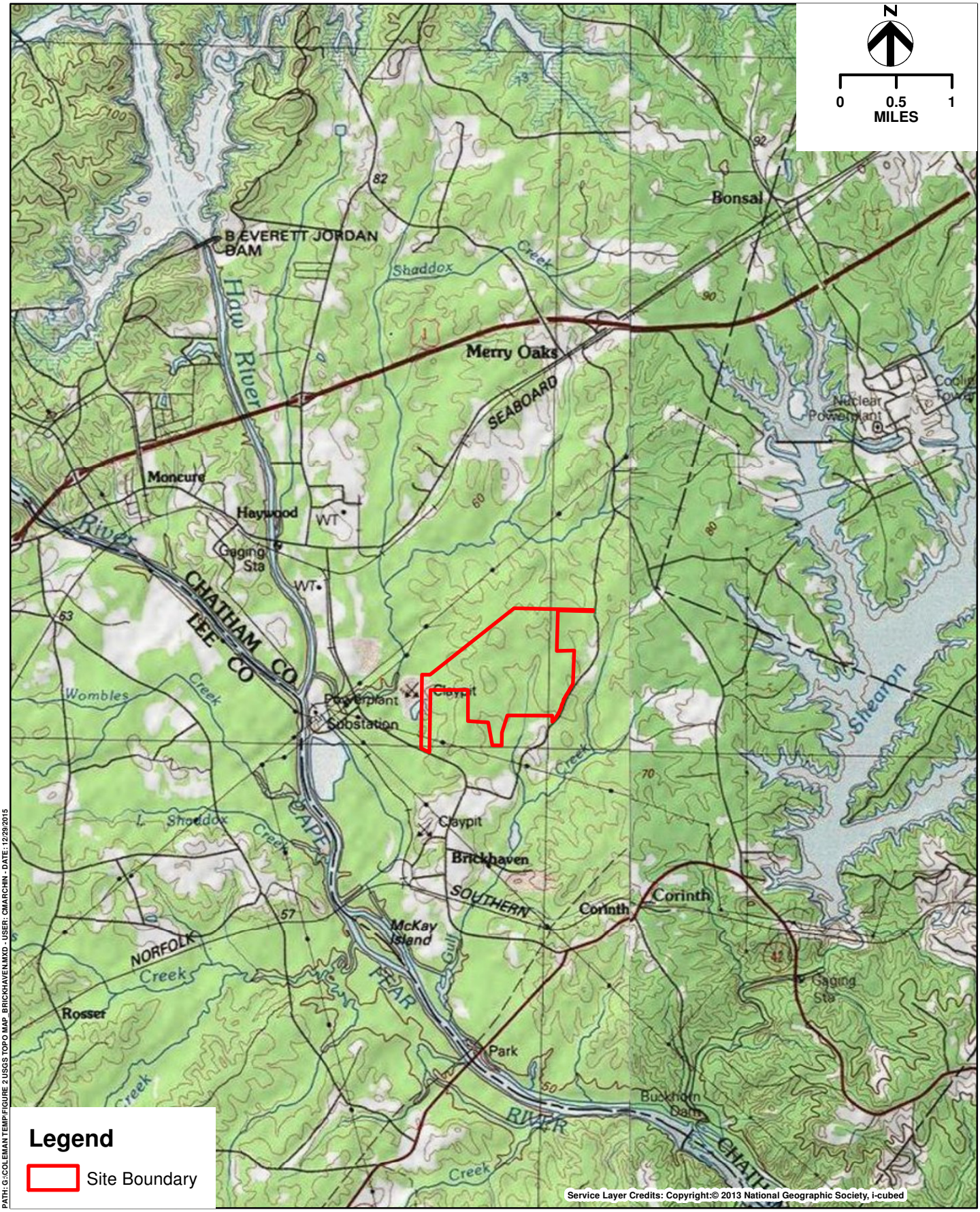
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

JANUARY 2016

FIGURE

1



PATH: G:\COLEMAN TEMP\FIGURE 2 USGS TOPO MAP_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 12/29/2015

REGIONAL USGS TOPOGRAPHIC MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

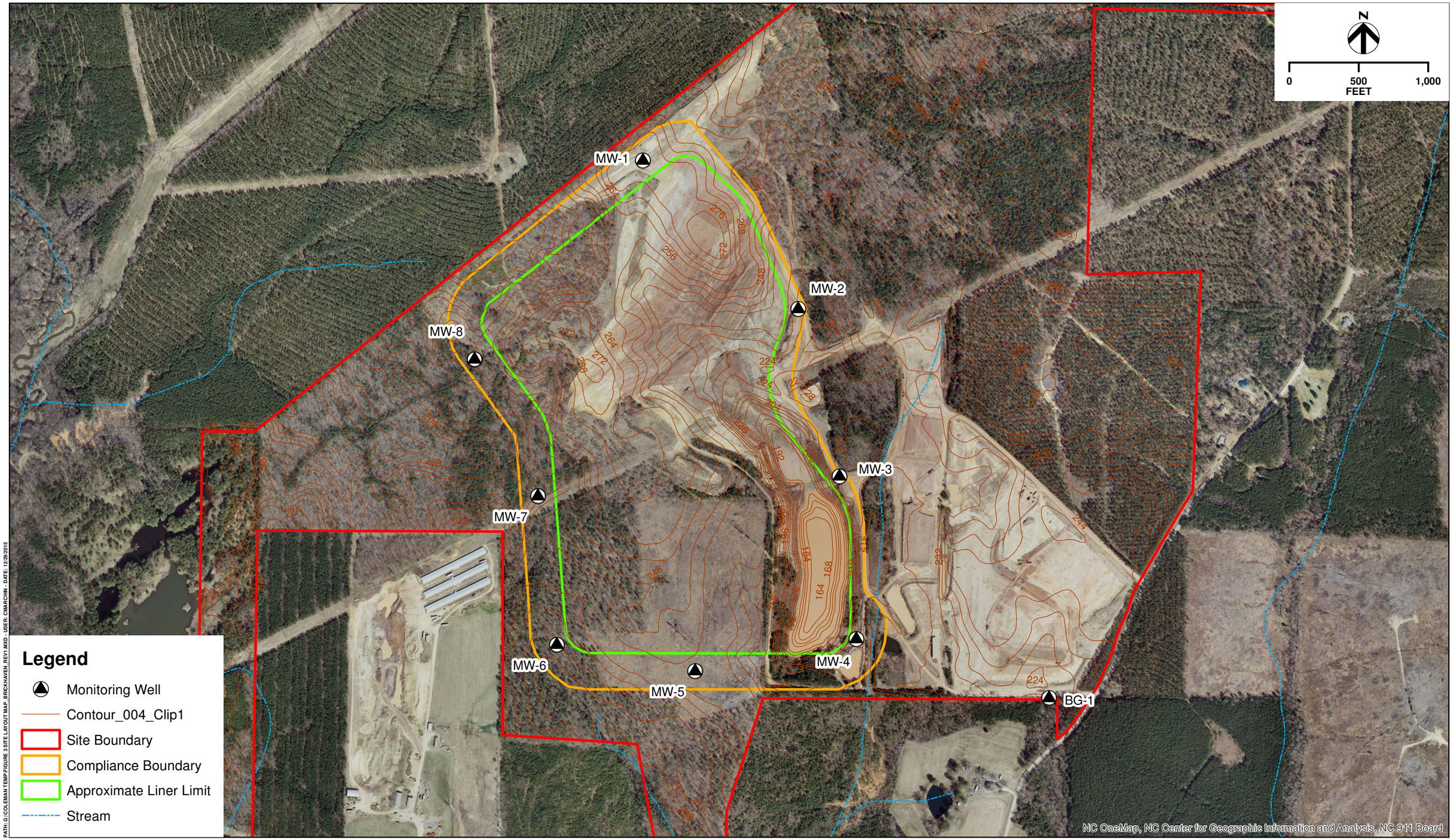
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

JANUARY 2016

FIGURE

2



PATH: G:\COLEMAN TEMP\FIGURE 3 SITE LAYOUT MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 12/29/2015

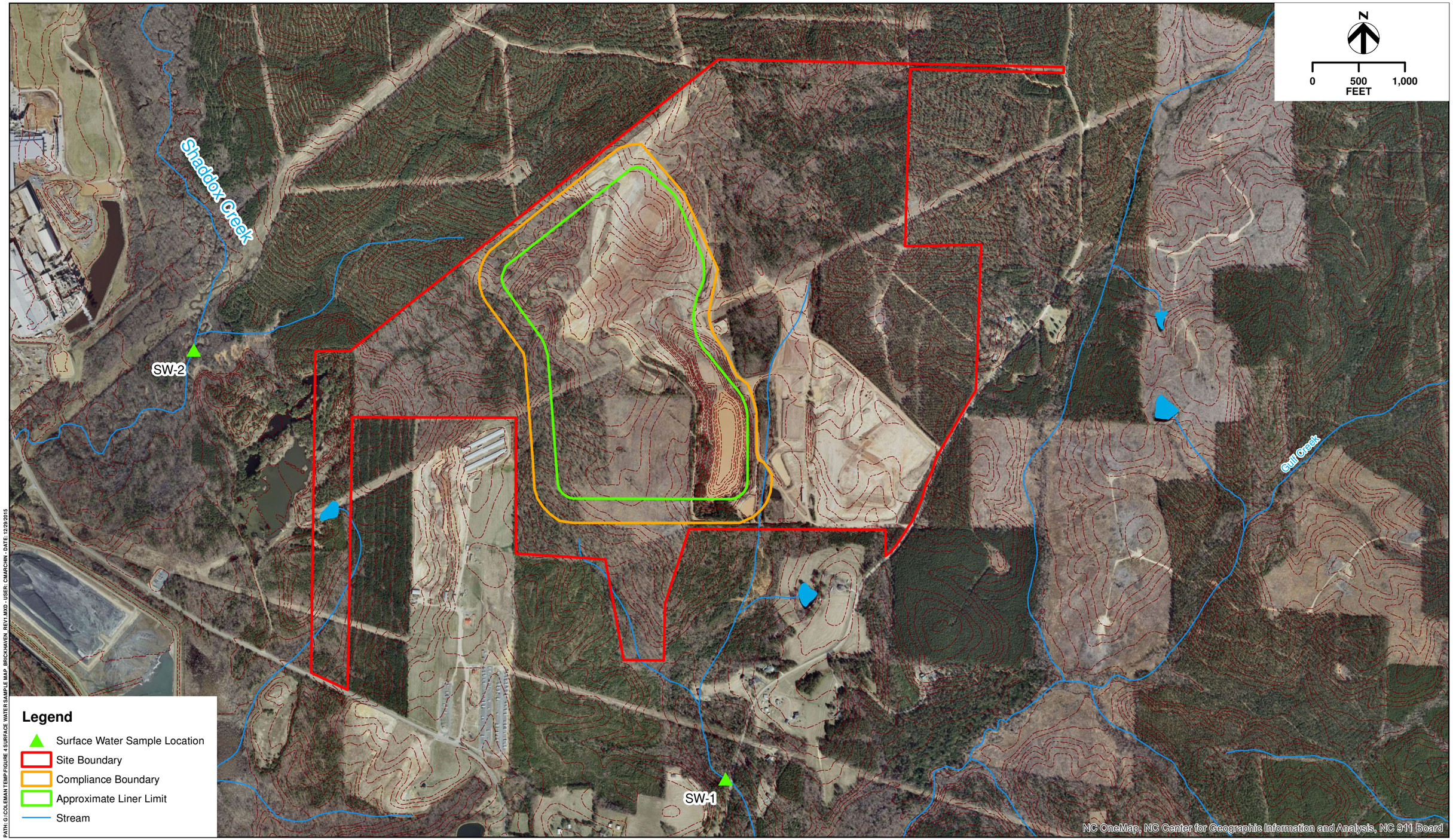
HDR

SITE LAYOUT MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
JANUARY 2016

FIGURE
3



PATH: G:\COLEMAN TEMP\FIGURE 4 SURFACE WATER SAMPLE MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 12/29/2015

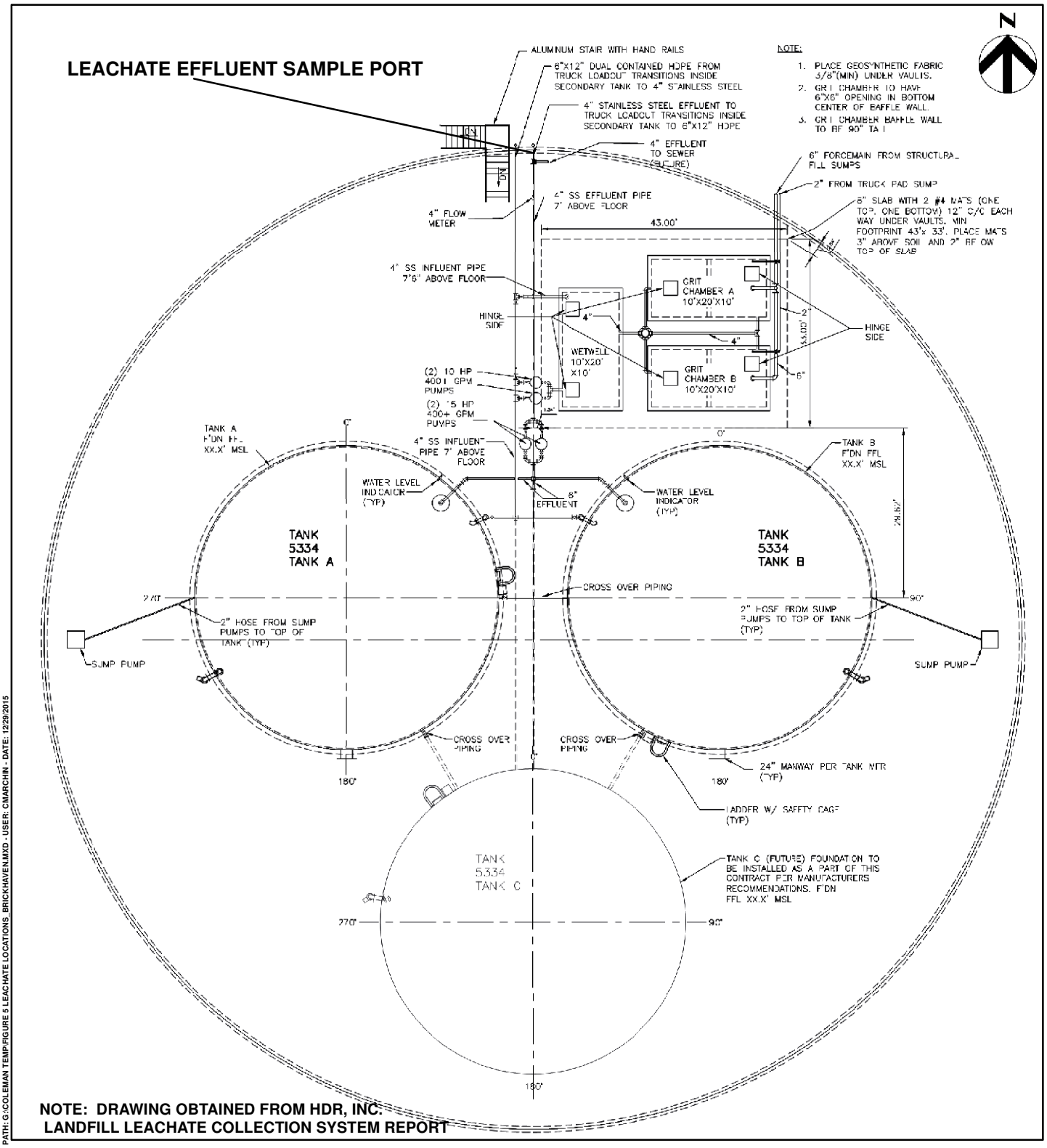
HDR

SURFACE WATER SAMPLE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
JANUARY 2016

FIGURE
4



NOTE: DRAWING OBTAINED FROM HDR, INC. LANDFILL LEACHATE COLLECTION SYSTEM REPORT

PATH: G:\COLEMAN TEMP\FIGURE 5 LEACHATE LOCATIONS_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 12/29/2015

LEACHATE SAMPLE COLLECTION LOCATION
CHARAH, INC.
MONCURE, NORTH CAROLINA

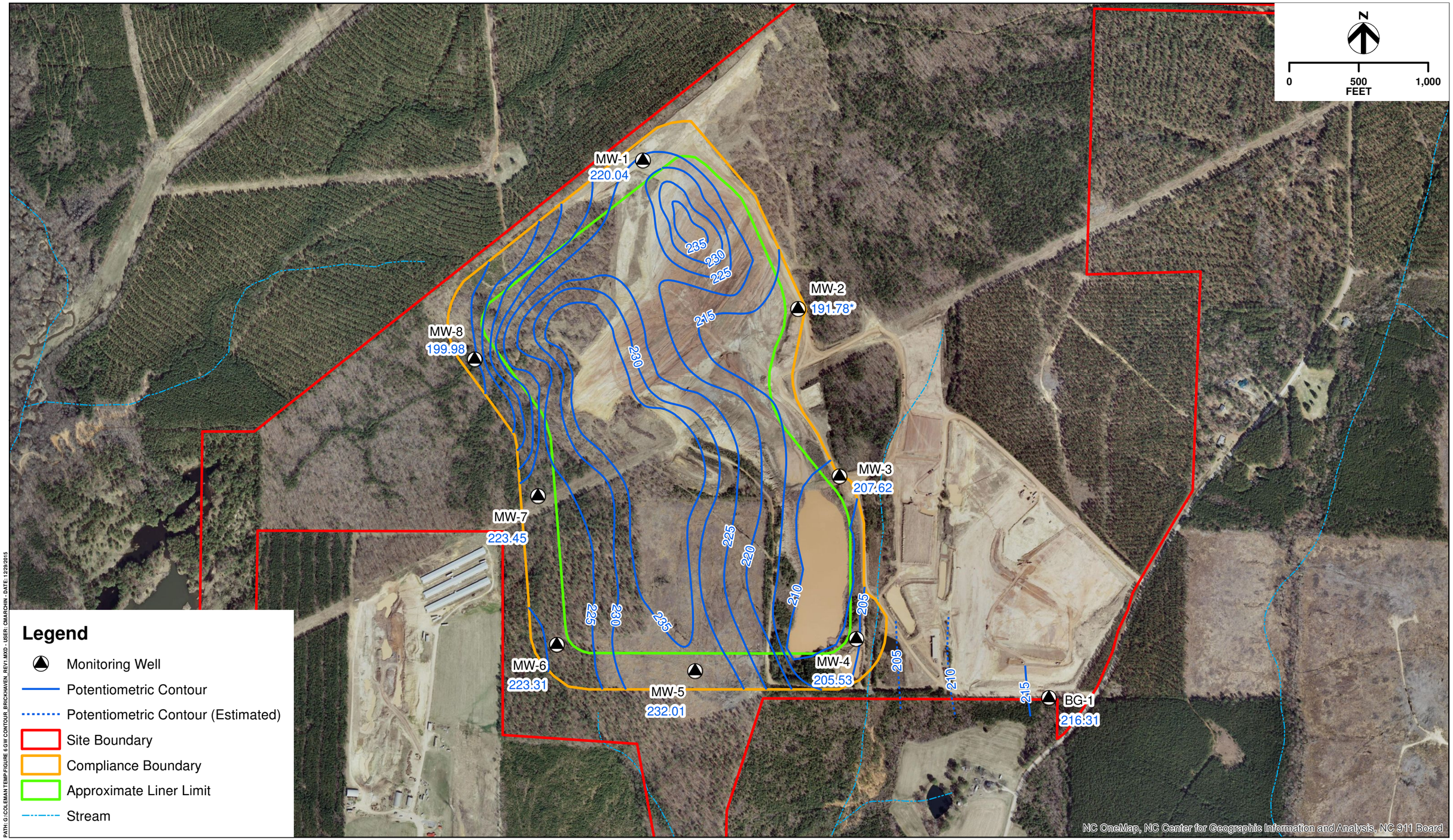
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

JANUARY 2016

FIGURE

5



PATH: G:\COLEMAN TEMP\FIGURE 6 GW CONTOUR_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 12/29/2015

Note:
1. Groundwater data was collected by Buxton Environmental, Inc. on August 12, 2015.
2. Groundwater elevation of monitoring well MW-2 appears to be anomalously low due to recharge and was not used in the potentiometric contouring process.

HDR

POTENTIOMETRIC SURFACE MAP - AUGUST 2015
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
JANUARY 2016

FIGURE
6

Tables

Table 1: Well Construction and Survey Summary
Table 2: Groundwater Elevations for August 12, 2015
Table 3: Hydraulic Conductivity
Table 4: Hydraulic Gradients
Table 5: Groundwater Flow Velocities
Table 6: Analytes Detections and Exceedances

Table 1: Well Construction and Survey Summary

Well ID	Northing	Easting	Pad Elev. (msl)	TOC Elev. (msl)	TD BGS (ft)	TD BTOC (ft)	Screen Length (ft)	Screen Interval (msl)	Lithologic Unit
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	Layered Rock/PWR*
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	Layered Rock/PWR*
MW-2	673677.07	1994537.54	227.45	229.97	45.00	47.52	15	197.45 - 182.45	Layered Rock/PWR*
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	PWR
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	Residuum/PWR
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	PWR
MW-6	671267.71	1992793.49	228.62	230.95	27.00	29.47	15	216.63 - 201.63	Residuum/PWR
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	Residuum/PWR
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	PWR

Notes:

1. Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.
2. Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.
3. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.

* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation

4. MW-6 was re-surveyed by Charah, Inc. on December 18, 2015 after damage sustained to the monitoring well in October 2015.

Table 2: Groundwater Elevations. August 12, 2015

Well ID	Screen Interval Elevation (msl)	DTW BTOC (ft)	DTW Elevation (msl)	Lithologic Unit
BG-1	200.14 - 185.14	11.88	216.31	Layered Rock/PWR*
MW-1	220.20 - 205.20	60.04	220.04	Layered Rock/PWR*
MW-2	197.45 - 182.45	38.19	191.78	Layered Rock/PWR*
MW-3	194.20 - 179.20	14.94	207.62	PWR
MW-4	201.79 - 191.79	11.60	205.53	Residuum/PWR
MW-5	208.72 - 198.72	12.85	232.01	PWR
MW-6	216.63 - 201.63	7.79	223.31	Residuum/PWR
MW-7	224.53 - 214.53	8.26	223.45	Residuum/PWR
MW-8	202.41 - 187.41	36.49	199.98	PWR

Notes:

1. Depth to water measurements obtained on August 12, 2015 to the nearest 0.01 foot with a depth-to-water meter by Buxton Environmental, Inc.
2. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.

* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation

Table 3: Hydraulic Conductivity. September 10, 2015

Well ID	DTW BTOC (ft)	Length of Water Column (ft)	Screen Length (ft)	Screen Interval (msl)	Hydraulic Conductivity (k, cm/sec)	Lithologic Unit
BG-1	12.46	30.59	15	200.14 - 185.14	7.76E-05	Layered Rock/PWR*
MW-1	59.97	15.33	15	220.20 - 205.20	4.11E-04	Layered Rock/PWR*
MW-2	40.98	6.54	15	197.45 - 182.45	3.41E-06	Layered Rock/PWR*
MW-3	15.55	27.81	15	194.20 - 179.20	4.08E-07	PWR
MW-4	11.61	14.04	10	201.79 - 191.79	1.41E-04	Residuum/PWR
MW-5	14.17	32.37	10	208.72 - 198.72	8.01E-06	PWR
MW-6	8.25	21.22	15	216.63 - 201.63	1.10E-04	Residuum/PWR
MW-7	9.11	8.07	10	224.53 - 214.53	1.26E-06	Residuum/PWR
MW-8	36.4	12.66	15	202.41 - 187.41	1.29E-04	PWR

Notes:

1. Depth to water measurements obtained on September, 2015 to the nearest 0.01 foot with a depth-to-water meter by Buxton Environmental, Inc. prior to slug testing.
2. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.
3. Hydraulic conductivity values determined by Buxton Environmental, Inc. on September 10, 2015 by conducting rising head slug tests; and solved utilizing the Bouwer-Rice (unconfined slug test) solution with AQTESOLV for Windows Version 4.50 software by Hydrosolv, Inc. (1996-2007).

* = interpreted lithologic unit based on relative drilling hardness during well installation

Table 4: Horizontal Hydraulic Gradients

Horizontal Hydraulic Gradient (*i* , dh/dl)									
	BG-1	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**
BG-1	-	0.0008				0.006	0.002	0.002	
MW-1		-				0.003	0.001	0.001	
MW-2	0.007	0.02	-	0.01	0.006	0.01	0.01	0.01	0.003
MW-3	0.004	0.005		-		0.01	0.007	0.007	
MW-4	0.007	0.004		0.002	-	0.02	0.008	0.01	
MW-5						-			
MW-6						0.009	-	0.0001	
MW-7						0.005		-	
MW-8	0.003	0.01		0.003	0.002	0.01	0.01	0.02	-

1. Positive horizontal hydraulic gradients calculated by dividing the difference in hydraulic head between a well pair by the lenth of the flow path between the well pair. (*i* = dh/dl)
2. All well pairs assumed to be screened in same surficial aquifer unit
3. Horizontal flow path distance calculated by $\sqrt{(Easting_1 - Easting_2)^2 + (Northing_1 - Northing_2)^2}$
4. Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.
5. Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.
6. Static water level elevations from August 12, 2015 monitoring event. See Table 2.

Table 5: Groundwater Flow Velocities

Groundwater Flow Velocity Between Well Pairs (V_s, ft/year)									
	BG-1	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**
BG-1	-	2.6				3.6	1.7	0.7	
MW-1		-				9.4	2.2	2.5	
MW-2	4.9	62.8	-	0.5	4.5	1.4	6.2	0.3	3.8
MW-3	2.6	15.8		-		1.0	3.8	0.1	
MW-4	7.9	10.3		1.4	-	15.6	7.3	3.6	
MW-5						-			
MW-6						4.7	-	0.05	
MW-7						0.2		-	
MW-8	4.9	39.7		3.0	2.1	11.1	12.1	12.9	-

1. Flow velocities between well pairs estimated by $V_S = \frac{Ki}{P_e}$

   Where: V_s = groundwater flow velocity

   K = horizontal hydraulic conductivity (See Table 3)

   i = horizontal hydraulic gradient (See Table 4)

   P_e = average effective porosity between given well pairs

2. Effective porosity values from geotechnical testing and the literature (McWhorter and Sunada, 1977; Sinhal and Gupta, 2010) where geotechnical data was not available.

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Table 6-1: Analytical Detections and Exceedances

First Round Results

August 2015

		Groundwater Analysis											Quality Control		Surface Water Analysis		
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Trip Blank	SW-1	SW-2	***NCSWWS***
EPA APPENDIX III																	
Boron (µg/l)	7440-42-8	8.5J	6.9J	36	34	8.1J	11J	8.1J	98	9.9J	*700*	--	1.2J	N/A	9.4J	87	*NS*
Calcium (µg/l)	7440-70-2	32,000B	150,000B	97,000B	150,000B	44,000B	17,000B	38,000B	37,000B	110,000B	*NS*	*NS*	880B	N/A	4,200B	12,000B	*NS*
Chloride (µg/l)	16887-00-6	**270,000**	**570,000**	**790,000**	**990,000**	**320,000**	22,000	230,000	**430,000**	**470,000**	*250,000*	--	ND	N/A	8,000	20,000	*250,000*
Fluoride (µg/l)	16984-48-8	220J	230J	ND	ND	510	740	490J	450J	ND	*2,000*	--	ND	N/A	90J	290	*1,800*
pH* (standard units, SU)	-	**6.44**	6.67	7.89	7.41	**6.35**	7.27	6.61	6.85	7.20	*6.5-8.5*	--	N/A	N/A	7.14	6.86	*6.0-9.0*
Sulfate (µg/l)	14808-79-8	23,000	22,000	79,000	24,000J	11,000	4,100	48,000	36,000	6,300	*250,000*	--	ND	N/A	890J	2,200	*250,000*
Total Dissolved Solids (µg/l)	-	**690,000B**	**1,500,000**	**1,700,000**	**2,100,000**	**820,000**	230,000	**680,000B**	**1,100,000B**	**1,300,000B**	*500,000*	--	ND	N/A	53,000B	180,000B	*500,000*
EPA APPENDIX IV																	
Antimony (µg/l)	7440-36-0	0.55J	0.23J	0.49J	0.31J	ND	0.58J	0.53J	0.63J	0.68J	*1*	--	0.38J	N/A	0.48J	0.62J	*5.6*
Arsenic (µg/l)	7440-38-2	2.2	2.8	3.2	6.7	2.0	0.75J	1.2	2.1	3.2	*10*	--	0.37J	N/A	1.1	2.9	*10*
Barium (ug/l)	7440-39-3	380	220	260	670	390	160	100	290	**1,100**	*700*	--	1.0J	N/A	49	110	*1,000*
Beryllium (µg/l)	7440-41-7	0.12J	ND	0.17J	ND	0.19J	ND	ND	ND	ND	*4*	--	ND	N/A	ND	ND	*6.5*
Cadmium (µg/l)	7440-43-9	0.061J	0.13	0.060J	ND	0.057J	ND	ND	0.18	0.071J	*2*	--	ND	N/A	0.050J	ND	*2*
Chromium (µg/l)	7440-47-3	ND	0.92J	5.2	1.1J	2.5J	1.8J	0.7J	0.84J	1.7J	*10*	--	ND	N/A	ND	ND	*50*
Cobalt (µg/l)	7440-48-4	0.88J	0.35J	1.6J	0.64J	**7.6**	1.5J	2.2J	1.2J	0.34J	*1*	--	ND	N/A	1.3J	1.4J	*3*
Fluoride (µg/l)	16984-48-8	220J	230J	ND	ND	510	740	490J	450J	ND	*2,000*	--	ND	N/A	90J	290	*1,800*
Lead (µg/l)	7439-92-1	1.3	0.34J	2.0	0.27J	2.8	1.2	0.45J	0.20J	0.53J	*15*	--	ND	N/A	0.38J	1.2	*25*
Lithium (µg/l)	7439-93-2	18.5	32.0	22.4	19.3	22.6	7.18J	28.1	21.1	27.6	*NS*	*NS*	ND	N/A	ND	ND	*NS*
Mercury (µg/l)	7439-97-6	0.075J	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	N/A	ND	ND	*0.012*
Molybdenum (µg/l)	7439-98-7	0.55J	0.95J	11	19	1.6J	1.5J	1.4J	3.6J	ND	*NS*	*NS*	ND	N/A	1.0J	ND	*160*
Selenium (µg/l)	7782-49-2	4.5	8.1	7.7	15	5.9	1.0	4.3	8.4	6.6	*20*	--	ND	N/A	ND	1.6	*5*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	--	ND	N/A	ND	ND	*0.24*
Radium 226 (pCi/l)	13982-63-3	0.802J	0.709J	1.33	0.990J	0.814J	0.564J	0.806J	0.423J	0.920J	*NS*	*5 (combined)*	0.489J	N/A	0.521J	0.363J	*NS*
Radium 228 (pCi/l)	15262-20-1	0.496U	0.538U	1.39U	2.03J	1.52U	0.520U	1.26U	0.271U	-0.831U	*NS*		1.13U	N/A	0.426U	0.468U	*NS*
EPA APPENDIX I METALS																	
Copper (µg/l)	7440-50-8	1.4B	0.87BJ	4.1B	1.6B	5.3B	3.2B	1.1B	1.3B	1.5B	*1,000*	--	0.94BJ	N/A	1.2B	1.5B	*7*
Nickel (µg/l)	7440-02-0	1.3J	2.5J	5.4	3.5J	8.2	3.0J	2.6J	4.3J	2.4J	*100*	--	ND	N/A	1.5J	1.8J	*88*
Silver (µg/l)	7440-22-4	ND	0.50J	ND	ND	ND	ND	ND	ND	1.6	*20*	--	ND	N/A	ND	ND	*0.06*
Vanadium (µg/l)	7440-62-2	**6.0**	2.7J	4.8J	2.5J	**5.9**	3.8J	1.6J	1.5J	2.5J	*0.3*	--	ND	N/A	ND	3.7J	*NS*
Zinc (µg/l)	7440-66-6	8.3J	6.3J	12	5.1J	31	16	5.8J	4.0J	5.1J	*1,000*	--	4.4J	N/A	28	7.0J	*50*
EPA APPENDIX I VOC'S																	
Acetone (µg/l)	67-64-1	ND	ND	1.6J	1.8J	ND	ND	1.6J	ND	ND	*6,000*	--	ND	ND	3.6J	7.3J	*2,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	**4.0**	**1.7**	ND	ND	ND	**3.5**	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	*NS*
Bromoform (µg/l)	75-25-2	ND	ND	1.4	1.0	ND	ND	ND	1.1	ND	*4*		ND	ND	ND	ND	*4.3*
Chloroform (µg/l)	67-66-3	ND	0.71J	4.5	1.2	ND	ND	ND	2.0	ND	*70*		ND	ND	ND	ND	*5.6*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	**3.7**	**2.6**	ND	ND	ND	**4.4**	ND	*0.4*		ND	ND	ND	ND	*NS*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	0.54J	ND	0.53J	0.93J	0.52J	0.51	0.54J	*700*	--	ND	ND	ND	ND	*NS*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	0.31J	ND	*70*	--	ND	ND	ND	ND	*47*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	0.19J	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	*63*

Notes:

1. Groundwater and surface water samples collected on August 12 & 13, 2015 and analyzed for above parameters by Shealy Environmental Servcies, Inc. and their subcontractor GEL Laboratories LLC (Lithium and Radium)
2. ND = below detection limits; NS = no standard; NT = not tested; VOC's = volatile organic compounds; J = approximated value
3. NCGPS = North Carolina Groundwater Protection Standard
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and shade denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. pH was field tested by Buxton Environmental, Inc. with a Horiba U-52, which was calibrated by and rented from Enviro-Equipment, Inc. of Pineville, NC.

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Table 6-2: Analytical Detections and Exceedances

Second Round Results

October 2015

		Groundwater Analysis											Quality Control			Surface Water Analysis		
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Trip Blank	Duplicate (MW-5)	SW-1	SW-2	***NCSWWS***
EPA APPENDIX III																		
Boron (µg/L)	7440-42-8	6.1	14.6	25.7	38	6.2	9	6.7	53.1	6.3	*700*	--	ND	ND	8.6	15.4	30	*NS*
Calcium (µg/L)	7440-70-2	38,200	36,500	153,000	185,000	46,200	16,900	38,100	34,200	117,000	*NS*	*NS*	ND	ND	14,800	3,470	10,000	*NS*
Chloride (µg/L)	16887-00-6	**311,000**	72,000	**972,000**	**1,160,000**	**344,000**	22,200	241,000	**422,00**	**515,000**	*250,000*	--	ND	ND	22,200	9,500	10,200	*250,000*
Fluoride (µg/l)	16984-48-8	100	160	340	220	280	590	450	380	ND	*2,000*	--	ND	ND	600	120	ND	*1,800*
pH* (standard units, SU)	-	**6.24**	7.3	7.7	7.6	**6.17**	7.3	6.65	6.62	7.0	*6.5-8.5*	--	ND	ND	N/A	6.46	6.21	*6.0-9.0*
Sulfate (µg/l)	14808-79-8	15,100	13,100	199,000	14,000	7,000	3,700	66,100	46,900	6,100	*250,000*	--	ND	ND	3,600	8,500	28,100	*250,000*
Total Dissolved Solids (µg/l)	-	**654,000**	370,000	**2,120,000**	**2,770,000**	**1,110,000**	296,000	**620,000**	**890,000**	**1,560,000**	*500,000*	--	ND	ND	300,000	382,000	205,000	*500,000*
EPA APPENDIX IV																		
Antimony (µg/l)	7440-36-0	ND	ND	**9.4**	**12**	ND	ND	**5.6**	**5.9**	**6.3**	*1*	--	ND	ND	ND	ND	ND	*5.6*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*
Barium (µg/l)	7440-39-3	443	117	372	**860**	232	306	117	237	**1,240**	*700*	--	ND	ND	117	178	70.70	*1,000*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	ND	ND	*6.5*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	**13**	ND	ND	**10.8**	ND	**10.7**	**33.9**	*10*	--	ND	ND	18.7	5.9	ND	*50*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	**7**	ND	ND	ND	*1*	--	ND	ND	ND	ND	**5.20**	*3*
Fluoride (µg/l)	16984-48-8	100	160	340	220	280	590	450	380	ND	*2,000*	--	ND	ND	ND	120	ND	*1,800*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	6.3	ND	ND	ND	*15*	--	ND	ND	ND	11.6	ND	*25*
Lithium (µg/l)	7439-93-2	14.90	20.9	34	70.4	20.1	7.5	43.1	23.5	27.4	*NS*	*NS*	ND	ND	8.0	5.1	2.80	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*
Molybdenum (µg/l)	7439-98-7	ND	ND	20.6	10.5	ND	ND	ND	ND	ND	*NS*	*NS*	ND	ND	ND	ND	ND	*160*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	--	ND	ND	ND	ND	ND	*0.24*
Radium 226 (pCi/L)	13982-63-3	0.362J	0.387J	0.681J	1.59J	0.281J	0.708J	0.172J	0.464J	0.0774J	*NS*	*5 (combined)*	0.0124J	0.482J	0.196J	0.141J	-0.344J	*NS*
Radium 228 (pCi/L)	15262-20-1	0.723J	0.0801J	1.56J	1.34J	0.0230J	0.331J	0.395J	0.273J	0.809J	*NS*		0.435J	0.0525J	0.211J	0.644J	0.245J	*NS*
EPA APPENDIX I METALS																		
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	16.4	ND	ND	ND	*1,000*	--	ND	ND	ND	**8.30**	6.70	*7*
Nickel (µg/l)	7440-02-0	ND	ND	7.80	ND	ND	12.6	ND	8.7	18.2	*100*	--	ND	ND	13.10	ND	ND	*88*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0.06*
Vanadium (µg/l)	7440-62-2	ND	ND	ND	ND	ND	**9.9**	ND	ND	ND	*0.3*	--	ND	ND	ND	19.40	6.90	*NS*
Zinc (µg/l)	7440-66-6	10	12.4	26.80	41.80	ND	106	11.50	18.6	12.0	*1,000*	--	ND	ND	37.80	24.70	18.80	*50*
EPA APPENDIX I VOC'S																		
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*
Chloroform (µg/l)	67-66-3	ND	ND	1.80	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*5.6*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*

Notes:

1. Groundwater and surface water samples collected from October 15 to October 19, 2015 and analyzed for above parameters by Pace Analytical Laboratories.
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and shade denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. Methylene chloride was detected at 2.8 µg/L in the equipment blank; methylene chloride is a common laboratory contaminant and is not from naturally occuring conditions at the Site.
10. pH was field tested by Pace Analytical Laboratories

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Table 6-3: Analytical Detections and Exceedances
Third Round Results
November 2015

		Groundwater Analysis											Quality Control			Surface Water Analysis			Leachate Analysis	
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Field Blank	Duplicate (MW-4)	SW-1	SW-2	***NCSWWS***	Leachate-1	***NCGPS***
EPA APPENDIX III																				
Boron (µg/l)	7440-42-8	5.9	NT	40.9	49.4	6.2	9.9	NT	NT	NT	*700*	--	ND	ND	7	13	21.9	*NS*	17.1	*700*
Calcium (µg/l)	7440-70-2	31,700	58,700	NT	157,000	39,200	12,400	37,600	44,200	194,000	*NS*	*NS*	ND	295,000	38400	3,290	8,110	*NS*	4,540	*NS*
Chloride (µg/l)	16887-00-6	**283,000**	172,000	**1,050,000**	**1,230,000**	**294,000**	21,700	242,000	**552,000**	**939,000**	*250,000*	--	ND	ND	287000	7,000	5,600	*250,000*	2,300	*250,000*
Fluoride (µg/l)	16984-48-8	120	160	300	220	340	590	390	370	ND	*2,000*	--	ND	ND	340	ND	ND	*1,800*	ND	*2,000*
pH* (standard units)	-	**6.38**	6.91	7.6	7.5	**6.3**	7.11	6.64	6.61	6.7	*6.5-8.5*	--	ND	ND	N/A	6.23	6.05	*6.0-9.0*	N/A	*6.5-8.5*
Sulfate (µg/l)	14808-79-8	17,500	9,800	238,000	12,300	5,900	3,100	137,000	44,300	4,400	*250,000*	--	ND	ND	6000	10,500	5,200	*250,000*	3,500	*250,000*
Total Dissolved Solids (µg/l)	-	**652,000**	**569,000**	257,000	256,000	395,000	235,000	429,000	129,000	224,000	*500,000*	--	ND	ND	369,000	292,000	117,000	*500,000*	27,000	*500,000*
EPA APPENDIX IV																				
Antimony (µg/l)	7440-36-0	ND	ND	**9.3**	**10.1**	ND	ND	ND	ND	**10.1**	*1*	--	ND	ND	ND	ND	ND	*5.6*	ND	*1*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*	ND	*10*
Barium (ug/l)	7440-39-3	344	153	306	**718**	191	93.2	142	364	**1550**	*700*	--	ND	ND	178	105	69.70	*1,000*	9.10	*700*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	ND	ND	*6.5*	ND	*4*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	7.2	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	8.7	ND	*50*	ND	*10*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*3*	ND	*1*
Fluoride (µg/l)	16984-48-8	120	160	300	220	340	590	390	370	ND	*2,000*	--	ND	ND	ND	ND	7.90	*1,800*	ND	*2,000*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	--	ND	ND	ND	7.6	ND	*25*	ND	*15*
Lithium (µg/l)	7439-93-2	**12.1**	NT	53.1	128	20	7.40	NT	NT	NT	*NS*	*NS*	ND	ND	22.4	6.4	ND	*NS*	6.50	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*	ND	*1*
Molybdenum (µg/l)	7439-98-7	ND	ND	21.1	10.4	ND	ND	ND	ND	ND	*NS*	*NS*	ND	ND	ND	ND	6.70	*160*	ND	*NS*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*	ND	*20*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	--	ND	ND	ND	ND	ND	*0.24*	ND	*0.28*
Radium 226 (pCi/l)	13982-63-3	0.800J	0.414J	0.985J	0.816J	0.406J	0.592J	0.0638J	0.856J	1.16J	*NS*	*5 (combined)*	ND	0.143J	0.620J	0.147J	0.172J	*NS*	0.137J	*NS*
Radium 228 (pCi/l)	15262-20-1	1.29J	0.511J	1.75J	1.95J	0.174J	0.359J	0.791J	1.15J	0.702J	*NS*		0.589J	0.298J	0.303J	1.94J	0.391J	*NS*	0.0712J	*NS*
EPA APPENDIX I METALS																				
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	6.60	ND	*7*	ND	*1,000*
Nickel (µg/l)	7440-02-0	ND	ND	ND	ND	ND	ND	ND	7.20	ND	*100*	--	ND	ND	ND	ND	ND	*88*	ND	*100*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0.06*	ND	*20*
Vanadium (µg/l)	7440-62-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.3*	--	ND	ND	ND	20.30	7.00	*NS*	ND	*0.3*
Zinc (µg/l)	7440-66-6	ND	ND	50.70	ND	ND	ND	ND	ND	22.10	*1,000*	--	ND	ND	ND	23.70	ND	*50*	39.90	*1,000*
EPA APPENDIX I VOC'S																				
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*	ND	*6,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*	ND	*0.6*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*	ND	*4*
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*5.6*	ND	*70*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*	ND	*0.4*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*	ND	*700*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*	ND	*70*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*	ND	*6*

Notes:

1. Groundwater and surface water samples collected on November 18 through November 20, 2015 and analyzed for above parameters by Pace Analytical Laboratories
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and shade denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. Methylene chloride was detected at 1.6 µg/L in the equipment blank; methylene chloride is a common laboratory contaminant and is not from naturally occuring conditions at the Site.
10. pH was field tested by Pace Analytical Laboratories

A

Appendix A – Regulatory Correspondence

Water Quality Monitoring Plan

Brickhaven No.2 Mine Tract “A” Structural Fill

Charah, Inc.

Moncure, NC

March 2015
Updated October 2015

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October 13, 2015

Mr. Larry Frost, Environmental Engineer (via electronic mail only)
Permitting Branch, Solid Waste Section
Division of Waste Management, NCDEQ
1646 Mail Service Center
Raleigh NC 27699

Re: Updated WQMP
Brickhaven No.2 Mine Tract "A", Permit 1910

Dear Mr. Frost,

On behalf of Green Meadow, LLC and Charah, Inc., HDR is providing the attached updated Water Quality Monitoring Plan for the Brickhaven No. 2 Mine Site Tract "A" Structural Fill Permit No. 1910.

The updated plan includes the following documents.

- Approved Water Quality Monitoring Plan, dated March 6th, by Buxton Environmental.
- Updated Figure A – Brickhaven Mine No. 2 Site Well Locations
- Well Installation Records - Monitoring wells (MW) 1, 2, 3, 4, 5, 6, 7, 8 and (BG) 1
- Well Abandonment Records – June 26, 2015 and October 2, 2015

Should you have any questions, comments, or require additional information, please contact me at 704.338.6843.

Sincerely,
HDR Engineering, Inc. of the Carolinas

Michael D. Plummer, PE
Project Manager

cc: Ed Mussler, NCDENR (via electronic mail; one hard copy via UPS)
Elizabeth Werner, NCDENR (via electronic mail)
Norman Divers, Charah (via electronic mail)
Glenn Amey, PG, Charah (via electronic mail)

Enclosures:
Water Quality Monitoring Plan, updated October 2015

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Contents

Water Quality Monitoring Plan 1

Appendix A – Brickhaven Mine No.2, Site Well Locations

Appendix B - Well Installation Reports

Appendix C - Well Abandonment Records

Revision History

Rev	Description of Change	Issue Date
0	Initial approval, Permit 1910	June 5, 2015
1	Added appendices A, B, C	October 13, 2015

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DESIGN HYDROGEOLOGIC REPORT – ADDENDUM, REVISION ~~1~~ 2
BRICKHAVEN MINE RECLAMATION STRUCTURAL FILL SITE
1315 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Prepared for:

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202
Ph: 704-338-6843

NCDENR - Solid Waste Section
217 W. Jones Street
Raleigh, North Carolina 27603
Ph: 919-707-8200

and

NCDENR, Division of Energy, Minerals and Land Resources
512 N. Salisbury Street
Raleigh, North Carolina 27604
1612 Mail Service Center
Raleigh, North Carolina 27699
Ph: 919-707-9200

~~November 6, 2014~~ January 4, 2015 **March 6, 2015**

Prepared by:

Ross Klingman, P.G.
Senior Geologist

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

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WATER QUALITY MONITORING PLAN

BRICKHAVEN MINE RECLAMATION STRUCTURAL FILL SITE
1315 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

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1.2	*Compliance Monitor Well Construction*	*1*
1.3	*Surface Water Sampling Locations*	*2*
1.4	*Leachate Sampling Location*	*2*
1.5	*Background Groundwater and Surface Water Monitoring, with Statistical Groundwater Evaluation*	*2*
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LIST OF FIGURES

Water Quality Monitoring Plan (Revised)

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1.0 WATER QUALITY MONITORING PLAN

Water quality monitoring will be conducted at the proposed Brickhaven Mine RSFS, in accordance with: NCSWS rules and guidance documents, General Assembly of North Carolina Session 2013-Senate Bill 729 (ratified) regarding coal combustion residuals, and requested changes to the Water Quality Monitoring Plan by Ms. Elizabeth Werner with the NCSWS during a February 20, 2015 conversation with Buxton Environmental, Inc. The water quality monitoring plan has been prepared to effectively provide early detection of any release of hazardous constituents, as to be protective of human health and the environment. Applicable NCSWS regulatory rules will be followed if a release of hazardous constituents is confirmed, however, required assessment and/or corrective measures have not been specifically outlined in this plan.

The monitoring activities will also be conducted in general accordance with NCSWS memorandums dated October 27, 2006, February 23, 2007 and October 16, 2007 concerning changes to laboratory detection limits and reporting requirements, and the *Solid Waste Section Guidelines for Groundwater, Soil and Surface Water Sampling* dated April 2008.

In developing the proposed water quality monitoring plan, we have considered structural fill configuration, waste stream, surrounding land use, site geologic and hydrogeologic characteristics (including but not limited to aquifer thickness, groundwater flow rate and direction, lithology, hydraulic conductivity, porosity and effective porosity). Supporting documentation concerning these considerations has been previously addressed in the Design Hydrogeologic Report.

1.1 Groundwater Points of Compliance

Buxton Environmental, Inc. proposes to conduct shallow groundwater quality monitoring at eight (8) permanent shallow compliance monitor wells (MW-1 through MW-8) (Figure 7). The wells will include the seven (7) downgradient/sidegradient compliance wells and one (1) upgradient background well (MW-1) (topographic elevated area on northeast corner of the site). Piezometers PZM-1 (MW-4), PZM-22 (MW-5), PZM-27 (MW-7), and PZM-28 (MW-8), which were installed during the Design Hydrogeologic investigation, will be utilized as compliance wells. The monitor wells will be generally installed at the review boundary (125 feet off the fill boundary) (where room allows); or ½ the distance from the fill boundary to the property boundary where the fill boundary is less than 250 feet off the property boundary. The permanent compliance wells should be completed prior to issuance of the Permit to Operate.

1.2 Compliance Monitor Well Construction

The compliance monitor wells should be constructed in a manner in which shallow groundwater quality and hydrogeologic characteristics can be adequately monitored.

The monitor wells will be installed by advancing a soil boring into the upper portion of the shallow aquifer. The wells will be constructed with 10 foot sections of 2-inch diameter mill slotted PVC screen

attached to an appropriate length of 2-inch diameter PVC casing. A sand pack will be placed in the annual space of the boring to approximately 2-feet above the well screen, an approximately 2-foot thick bentonite seal will be placed above the sand, and the remaining annual space will be filled to grade with bentonite grout. The wells will be completed at grade with a 3 x 3 foot x 6-inch thick concrete pad and lockable stand-up cover. Three well guard posts will be placed around each well to protect the well from vehicle damage. The proposed compliance monitor wells will be completed in accordance with North Carolina Well Construction Standards (15A NCAC 02C .0108). A typical compliance well construction diagram is provided in Appendix N of the Design Hydrogeologic Report.

Following the completion activities, each well will be developed to the fullest extent possible.

Following installation of new compliance wells, borings logs and Well Construction Records (Form GW-1b) should be submitted to the NCSWS in hard copy and electronic format (pdf). Boring logs and Well Construction Records for currently installed compliance wells PZM-1/MW-4, PZM-22 (MW-5), PZm-27 (MW-7) and PZM-28 (MW-8) are provided in Appendix F of the Design Hydrogeologic Report.

1.3 Surface Water Sampling Locations

Surface water sampling is proposed to be conducted at two locations. One surface water sample will be collected at a tributary creek of Gulf Creek which crosses Moncure-Flatwood Road approximately 2,000 feet south of the site (SW-1); and one surface water sample will be collected along Shaddox Creek approximately 2,000 feet west of the site (SW-2) (reference Figure 1). Off-site access agreements may be required.

1.4 Leachate Sampling Location

Buxton Environmental, Inc. understands that leachate from the Brickhaven Mine RSFS will collect into sumps, which will then be pumped into an aboveground holding tank. One (1) composite leachate sample is proposed to be conducted from the aboveground holding tank, in order to determine site specific characteristics of the leachate.

1.5 Background Groundwater and Surface Water Monitoring, with Statistical Groundwater Evaluation

A minimum of eight (8) independent background groundwater monitoring events should be conducted at the eight (8) proposed compliance wells. Ms. Elizabeth Werner with the NCSWS indicated during the February 20, 2015 telephone conversation with Buxton Environmental, Inc. that only 1 initial independent background groundwater sampling event would be necessary, prior to placement of coal combustion residuals. A minimum of one background sampling event should be conducted at the two surface water sample locations. The initial background groundwater and surface water monitoring events should be conducted prior to issuance of the Permit to Operate.

At each compliance monitor well, groundwater level measurements will be made to within 0.01 of a foot with a depth to water electrode.

The purging and sampling of the wells will be conducted with low flow sampling techniques specified in the *Solid Waste Section Guidelines for Groundwater, Soil and Surface Water Sampling* dated April 2008. Field parameters including temperature, pH, specific conductance, temperature, dissolved oxygen and turbidity will be collected until field parameters have stabilized within specific tolerances for three consecutive readings.

The groundwater and surface water samples will be analyzed for Appendix III constituents (including additional Appendix I metals outlined in 40 CFR Part 258 and in general accordance with applicable NCSWS guidance and Senate Bill 729).

For quality control purposes, one trip blank and one equipment blank will be analyzed for Appendix III constituents (including additional Appendix I metals outlined in 40 CFR Part 258 and in general accordance with applicable NCSWS guidance and Senate Bill 729). The laboratory analyses will be conducted by a North Carolina certified laboratory in accordance with Level I (standard) QA/QC procedures. Sample collection, handling and storage will be conducted in general accordance with accepted protocol, including chain-of-custody documentation.

The eight (8) background monitoring events will be conducted over a 1 year period of time with an approximately 1.5 month spacing commencing immediately following issuance of the Permit to Construct. The initial independent background groundwater sampling event will be conducted prior to issuance of the Permit to Operate and placement of coal combustion residuals.

Statistical Groundwater Evaluation

A statistical evaluation of the background groundwater data will be conducted in accordance with NCSWS rules utilizing the basic method outlined below.

In order to determine the most appropriate statistical method to evaluate the groundwater data, a Shipiro-Wilk Test was first conducted to determine the normality (distribution) of the data. Based on the distribution (parametric or non-parametric) and percentage of detected target constituents at the site, the Kruskal-Wallis Test and/or the Wilcoxon Rank-Sum Test for Two Groups would likely be utilized to evaluate the background groundwater data. However, other approved statistical methods could be employed to more adequately analyze the data if needed, based on the groundwater analytical results.

The background groundwater and surface water sampling with statistical evaluation report will be submitted within 90 days of completion of the eighth (8th) and final background sampling event.

1.6 Semi-Annual Groundwater, Surface Water and Leachate Monitoring, with Statistical Groundwater Evaluation

Semi-annual groundwater, surface water and leachate monitoring activities will be conducted at the site. These activities are anticipated to be conducted in April and October of each year during the active life and post-closure period of the proposed Brickhaven Mine RSFS.

At each compliance monitor well, groundwater level measurements will be made to within 0.01 of a foot with a depth to water electrode.

The low flow purging and sampling of the wells should be conducted as specified in the *Solid Waste Section Guidelines for Groundwater, Soil and Surface Water Sampling* dated April 2008. Field parameters including temperature, pH, specific conductance, temperature, dissolved oxygen and turbidity will be collected until field parameters have stabilized within specific tolerances for three consecutive readings.

The groundwater, surface water and leachate samples will be analyzed for Appendix III constituents (including additional Appendix I metals outlined in 40 CFR Part 258 and in general accordance with applicable NCSWS guidance and Senate Bill 729). The leachate sample will also be analyzed for biologic oxygen demand (BOD), chemical oxygen demand (COD), total dissolved solids (TDS), sulfate, nitrate and phosphate. For quality control purposes, one trip blank and one equipment blank will be analyzed for Appendix III constituents (including additional Appendix I metals outlined in 40 CFR Part 258 and in general accordance with applicable NCSWS guidance and Senate Bill 729). The laboratory analyses are proposed to be conducted by a North Carolina certified laboratory in accordance with Level I (standard) QA/QC procedures. Sample collection, handling and storage will be conducted in general accordance with accepted protocol, including chain-of-custody documentation.

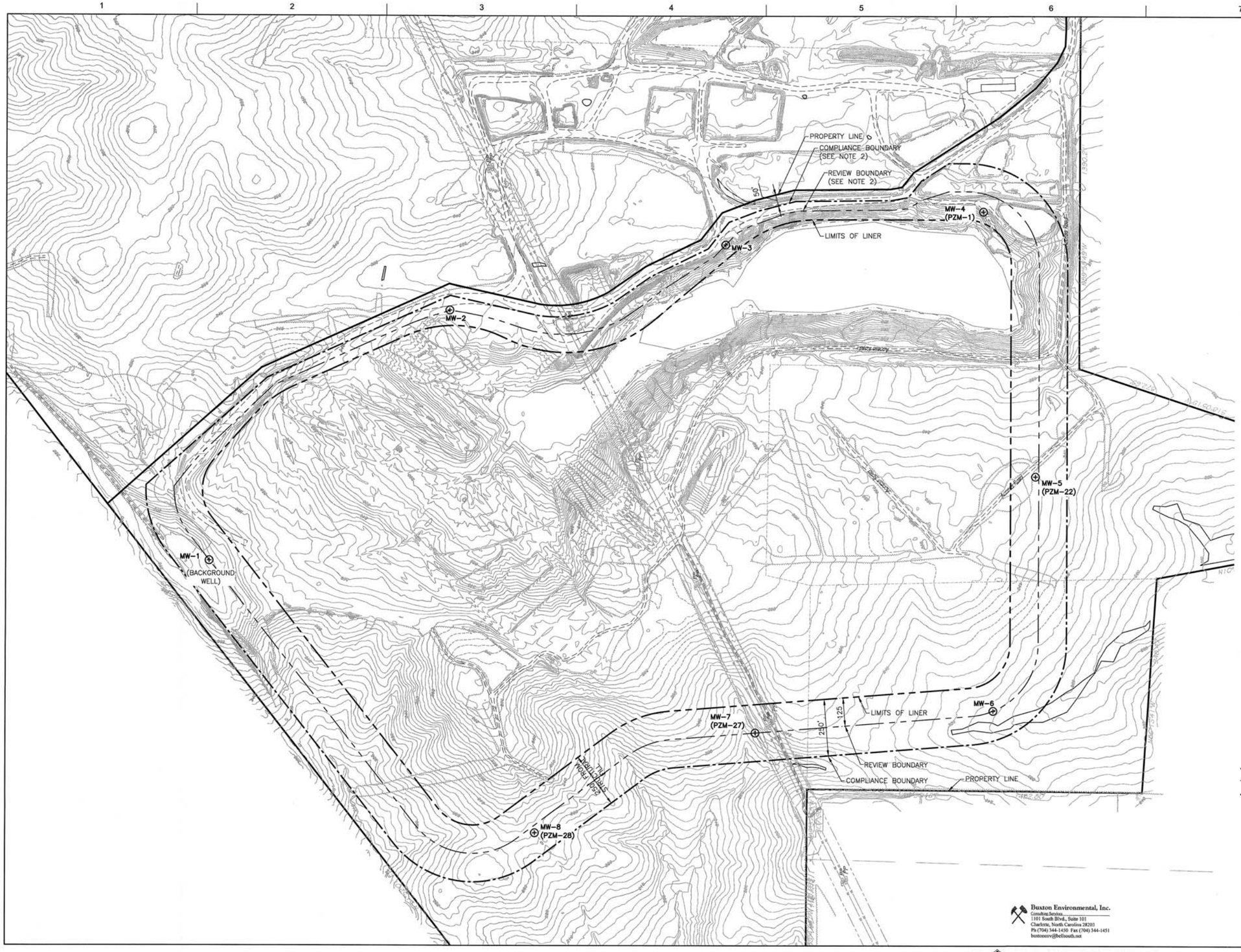
Statistical Evaluation of Historical Groundwater Quality Data

A statistical evaluation of historical groundwater quality data will be conducted in accordance with NCSWS rules utilizing the basic method outlined below.

Based on the distribution (parametric or non-parametric) and percentage of detected target constituents at the site, the Kruskal-Wallis Test and/or the Wilcoxon Rank-Sum Test for Two Groups would likely be utilized to evaluate the historical groundwater data. However, other approved statistical methods could be employed to more adequately analyze the data if needed, based on the groundwater analytical results.

Following receipt of the analytical data, a groundwater, surface water and leachate monitoring report with statistical evaluation of groundwater will be prepared in general accordance NCSWS guidelines. The report will include an executive summary, methods, results, conclusions and recommendations, tables of gauging and sample results, groundwater flow rates and groundwater flow direction map. The report will be prepared by a North Carolina Professional Geologist or Engineer.

A copy of the report should be submitted to the NCSWS within 120 days of the sampling date. The owner or operator shall notify the NCSWS of any exceedance of NCSWS, Groundwater Protection Standards (NCGPS's) within 14 days of this finding. An Assessment Monitoring Program will be required to be implemented within 90 days following an exceedance of the NCGPS, unless a successful alternate source demonstration can be made justifying an alternate cause of the exceedance.



N

NOTES:

1. SURVEY BASE MAP PREPARED BY LAWRENCE ASSOCIATES OF MONROE DATED SEPT 5, 2014.
2. IN AREAS WHERE THE STRUCTURAL FILL (I.E. PROPOSED LIMITS OF LINER) IS CLOSER THAN 250 FEET TO THE PROPERTY LINE, THE COMPLIANCE BOUNDARY IS SET AT 50 FEET FROM THE PROPERTY LINE. IN THESE AREAS, THE REVIEW BOUNDARY IS SET AT HALF THE DISTANCE BETWEEN THE STRUCTURAL FILL AND THE COMPLIANCE BOUNDARY.
3. SEE FIGURE 1 FOR PROPOSED SURFACE WATER SAMPLE LOCATIONS SW-1 AND SW-2.

LEGEND

MW-8 ⊕	MONITOR WELL LOCATION (AT REVIEW BOUNDARY)
— — —	COMPLIANCE BOUNDARY
—·—·—	REVIEW BOUNDARY
—··—··—	STRUCTURAL FILL / LINER LIMITS

Buxton Environmental, Inc.
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1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

HDR Engineering Inc. of the Carolinas
440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

This drawing has been superceded. Refer to revised Figure 7 in well installation report.

ISSUE	DATE	DESCRIPTION
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. KLINGMAN, P.G.
DRAWN BY	J. GAUL
CHECKED BY	A. WHITE P.G.
PROJECT NUMBER	453925-237673-018

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

Charah®

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

WATER QUALITY MONITORING PLAN

0 1" 2"

FILENAME 01G-13.dwg
SCALE 1"=200

SHEET
FIGURE 7

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A

Appendix A – Figure, Monitoring Well Locations

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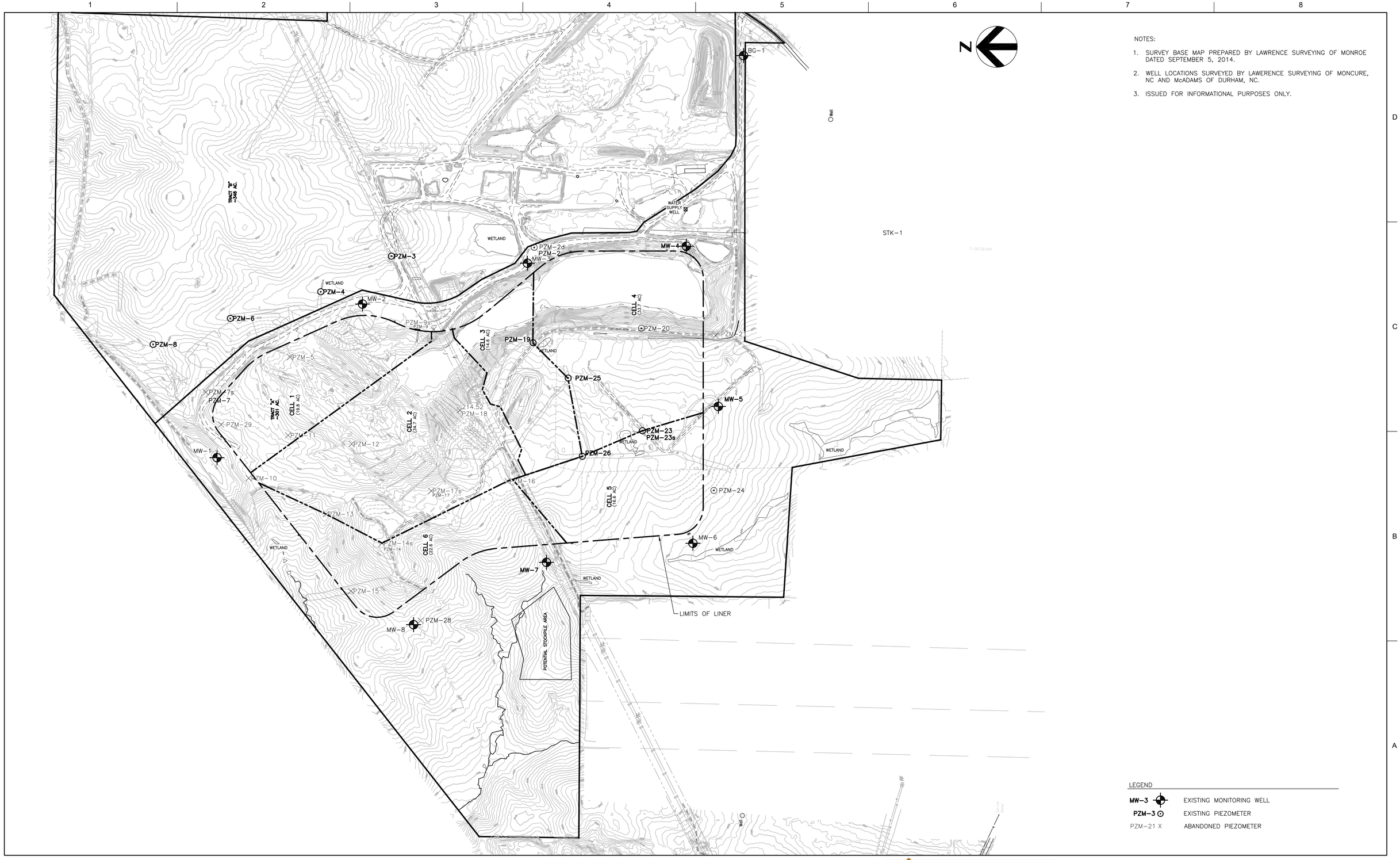

NOTES:

1. SURVEY BASE MAP PREPARED BY LAWRENCE SURVEYING OF MONROE DATED SEPTEMBER 5, 2014.
2. WELL LOCATIONS SURVEYED BY LAWERENCE SURVEYING OF MONCURE, NC AND McADAMS OF DURHAM, NC.
3. ISSUED FOR INFORMATIONAL PURPOSES ONLY.

LEGEND

MW-3	EXISTING MONITORING WELL
PZM-3	EXISTING PIEZOMETER
PZM-21 X	ABANDONED PIEZOMETER

HDR Engineering Inc.
of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
A	10/5/15	ISSUED FOR INFORMATIONAL PURPOSES

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	
DRAWN BY	J. GAUL
CHECKED BY	
PROJECT NUMBER	453925-237673-018

Charah®

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

BRICKHAVEN MINE NO. 2
SITE WELL LOCATIONS

0 1" 2"

FILENAME 01G-11A.dwg
SCALE 1"=300

SHEET
FIGURE A

C:\pwworking\tpa\d0565687\01G-11A.dwg, Plot, 10/5/2015 11:16:25 AM, jgaul

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B

Appendix B - Well Installation Reports

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Buxton Environmental, Inc.
1101 South Blvd., Suite 101 ~ Charlotte, North Carolina 28203
Phone (704) 344-1450 ~ Fax (704) 344-1451 ~ e-mail: buxtonenv@bellsouth.net

October 2, 2015

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202

Subject: ***Compliance Groundwater Monitor Well Installation, Development, Surveying & Hydraulic Conductivity Determination Activities***
Brickhaven No. 2 Mine Tract "A" Structural Fill Site
1271 Moncure-Flatwood Road
Moncure, North Carolina
Permit No.: 1910-STRUCT-2015

Dear Mr. Plummer,

Buxton Environmental, Inc. respectfully submits this report documenting compliance groundwater monitor well installation, development, surveying and hydraulic conductivity determination activities at the Brickhaven No. 2 Mine Tract "A" Structural Fill Site located at 1271 Moncure-Flatwood Road in Moncure, North Carolina. The on-site compliance groundwater monitor well system was installed in general accordance with North Carolina Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section (NCSWS) 15A NCAC 13B Rules and guidelines; compliance monitor well construction specifications outlined in the *Design Hydrogeologic Report – Addendum, Revision 1* prepared on December 31, 2014 by Buxton Environmental, Inc. for the Brickhaven site; the subsequent *Water Quality Monitoring Plan* prepared by Buxton Environmental, Inc. and submitted to NCSWS as a stand-alone document by HDR Engineering of the Carolinas, Inc. (HDR) on March 23, 2015; the *Permit to Construct/Permit to Operate* (pertaining to Attachment 2-Conditions of Construction-Line Numbers 9, 10, 11 and 12) which was issued for the site by the NCSWS on June 5, 2015; North Carolina Well Construction Standards (15A NCAC 02C .0108); and telephone conversations between the NCSWS and Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. concerning modifications to the approved *Water Quality Monitoring Plan*. Modifications to the *Water Quality Monitoring Plan*, which included the slight adjustment of the approved locations of monitor wells MW-2, MW-3 and MW-6 in order to accommodate on-site features, and the installation of additional background monitor well BG-1 were verbally approved by Ms. Elizabeth Werner with the NCSWS on June 22, 2014 and July 17, 2014, respectively. A Groundwater Monitoring System Map is provided in Figure 1.

1.0 BACKGROUND INFORMATION

The original approved *Water Quality Monitoring Plan* stipulated the installation of one (1) upgradient background monitor well (MW-1) and seven (7) downgradient/sidegradient monitor wells (MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8) to be installed at the review boundary outside and adjacent to the structural fill boundary, in order to monitor groundwater quality at the site. Monitor wells MW-4, MW-5, MW-7 and MW-8 were to be converted from piezometers PZM-1, PZM-22, PZM-27 and PZM-28, respectively, which were installed during the Design Hydrogeologic Report assessment. Piezometer PZM-

28 remained dry during the investigation and was unable to be utilized as monitor well MW-8, therefore, it was appropriately abandoned on September 17, 2015. The methods and results of abandonment of PZM-28 will be submitted the NCSWS in a separate report. A deeper replacement MW-8 was required to be installed immediately adjacent to PZM-28, in order to reach the water table, as discussed below.

On June 22, 2015, Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. contacted Ms. Elizabeth Werner with the NCSWS via telephone to request a slight adjustment in the location of monitor wells MW-2, MW-3 and MW-6 (the wells would be moved approximately 20 to 50 feet from the approved locations, but remain between the structural fill boundary and the property boundary), in order to accommodate on-site features. During the conversation, Ms. Werner verbally approved our request to adjust the locations of these wells.

On July 17, 2015, Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. contacted Ms. Elizabeth Werner with the NCSWS via telephone to request the installation of an additional background monitor well (BG-1) to be installed approximately 1,500 feet to the east of the southeast corner of the structural fill boundary, near the guard house and adjacent to Moncure-Flatwood Road. The additional background well would assist with upcoming background (8 independent background events) and future semi-annual groundwater quality monitoring at the site. During the conversation, Ms. Werner verbally approved the installation of the additional background monitor well.

The subject site is located in the Triassic Basin Belt of the Piedmont Physiographic Province, according to the 1985 *North Carolina Geologic Map* prepared by the North Carolina Geological Survey. The Triassic Period is generally recognized to have occurred from approximately 208 to 245 million years ago. The majority of the subject property is located within the Sanford Formation (T_{RCS}) which contains sedimentary rocks consisting of conglomerate, fanglomerate, sandstone and mudstone.

2.0 COMPLIANCE GROUNDWATER MONITOR WELL INSTALLATION ACTIVITIES

Installation of MW-4, MW-5 & MW-7 (converted from piezometers PZM-1, PZM-22 & PZM-27)

From August 13 through December 2, 2014, Mr. Ross Klingman, P.G. (North Carolina Geologist License No.: 1266) with Buxton Environmental, Inc. conducted the oversight of the installation of monitor wells MW-4, MW-5 and MW-7, which were converted from piezometers PZM-1, PZM-22 and PZM-27 installed during the Design Hydrogeologic Report assessment, respectively. Monitor well MW-4 was installed by Mr. Johnny Burr (NC Well Contractor Certification No.: 3098A) with Geologic Exploration, Inc. of Statesville, North Carolina. Monitor wells MW-5 and MW-7 were installed by Mr. Robert Cassell (NC Well Contractor Certification No.: 4143A) with Summit Engineering & Construction Services, Inc. (Summit) of Charlotte, North Carolina. These monitor wells were installed utilizing hollow-stem auger drilling (8-inch outer diameter, 4 1/4-inch inner diameter) with split-spoon standard penetration test (SPT) sampling technology. Split-spoon soil samples were generally collected at each boring at 0-1.5 feet and 3.5-5 feet, then at 5-foot intervals to the terminus of the boring. SPT blow counts were recorded every 6-inches in three increments (18-inch total) over the 24-inch length of the split-spoon sampler. Blow counts for the second and third 6-inch increments are added together to determine Standard Penetration Resistance (N). Drilling equipment was appropriately decontaminated prior to and between use at each well location. The lithology of the each soil sample was logged in the field by Buxton Environmental, Inc. in general accordance with ASTM D 653 standards (included moisture content, Munsell (2000) soil color, density or consistency, grain size, plasticity, cohesion and geologic unit).

The monitor wells were constructed with 10-foot sections of 2-inch diameter, Schedule 40, 0.01-foot mill slotted PVC well screen; an appropriate length of 2-inch diameter, Schedule 40 PVC riser pipe; with a sand pack around the screen; a minimum of 2-feet of hydrated bentonite above the sand pack; and grout (cement and sodium bentonite) above the bentonite seal to the ground surface. The monitor wells were completed at grade with a concrete well pad and lockable steel stand-up cover. The drilling activities were conducted in accordance with North Carolina Well Construction Standards (15A NCAC 02C .0108). Water levels were obtained to the nearest 0.01 foot with a depth-to-water meter approximately 1 hour and 24 hours following installation by Buxton Environmental, Inc. Each well was equipped with a permanently affixed well tag indicating the well contractor name, driller certification number, date of well completion, total depth of well, screen length, depth of sand, bentonite and grout, and well identification number. The boring logs and Well Construction Records (Form GW-1) are provided in Appendix A. A summary of compliance monitor well details is provided in Table 1.

Buxton Environmental, Inc. understands that protective guard post will be installed each monitor well.

Installation of MW-1, MW-2, MW-3, MW-6, MW-8 & BG-1

From June 19 through July 30, 2015, Mr. Ross Klingman, P.G. (North Carolina Geologist License No.: 1266) with Buxton Environmental, Inc. conducted the oversight of the installation of monitor wells MW-1, MW-2, MW-3, MW-6, MW-8 and BG-1. These monitor wells were installed by Mr. Steve Poloiewicz (NC Well Contractor Certification No.: 2284A) with SAEDACCO, Inc. of Fort Mill, South Carolina. These monitor wells were installed utilizing hollow-stem auger drilling (8-inch outer diameter, 4 1/4-inch inner diameter) with split-spoon SPT sampling, or air hammer drilling (5 7/8-inch outer diameter) technology. Hollow-stem auger drilling was generally utilized unless auger refusal was encountered (auger refusal was encountered at MW-1, MW-2 and BG-1), then air hammer drilling was employed to advance the boring to the target depth. However, if the well was located immediately adjacent to a piezometer installed with hollow-stem auger drilling and SPT sampling during the Design Hydrogeologic Report assessment, then air hammer drilling was utilized from the ground surface to the terminus of the boring (MW-3 and MW-8), as sufficient lithologic information had previously been obtained (boring logs for PZM-2/2D (MW-3) and PZM-28 (MW-8) are provided in Appendix A). Split-spoon soil samples were generally collected at each boring from 4 to 5.5 feet, then at 5-foot intervals to the terminus of the boring unless auger refusal was encountered. SPT blow counts were recorded every 6-inches in three increments (18-inch total) over the 24-inch length of the split-spoon sampler. Blow counts for the second and third 6-inch increments are added together to determine Standard Penetration Resistance (N). Air hammer cuttings were collected at five foot intervals to the target depth. Drilling equipment was appropriately decontaminated prior to use at each well location. The lithology of the each soil sample was logged in the field by Buxton Environmental, Inc. in general accordance with ASTM D 653 standards (included moisture content, Munsell (2000) soil color, density or consistency, grain size, plasticity, cohesion and geologic unit).

The monitor wells were constructed with 15-foot sections of 2-inch diameter, Schedule 40, 0.01-foot mill slotted PVC well screen; an appropriate length of 2-inch diameter, Schedule 40 PVC riser pipe; with a sand pack around the screen; a minimum of 2-feet of hydrated bentonite above the sand pack; and grout (cement and sodium bentonite) above the bentonite seal to the ground surface. The monitor wells were completed at grade with a concrete well pad and lockable steel stand-up cover. The drilling activities were conducted in accordance with NCDENR Well Construction Standards (15A NCAC 02C .0108). Water levels were obtained to the nearest 0.01 foot with a depth-to-water meter approximately 1 hour and 24 hours following installation by Buxton Environmental, Inc. Each well was equipped with a permanently affixed well tag indicating the well contractor name, driller certification number, date of well completion, total depth of well,

screen length, depth of sand, bentonite and grout and well identification number. The boring logs and Well Construction Records (Form GW-1) are provided in Appendix A. A summary of compliance monitor well details is provided in Table 1.

Buxton Environmental, Inc. understands that protective guard post will be installed each monitor well.

3.0 DEVELOPMENT OF MONITOR WELLS

During the *Design Hydrogeologic Report* assessment, initial development of monitor wells MW-4 and MW-5 was conducted by Buxton Environmental, Inc. These wells were developed by raising and lowering a submersible pump equipped with polyethylene tubing across the wet portion of the well in order to break-up and remove sediments from the well. The development was conducted until the well went dry. Approximately 10 gallons of water were removed from MW-4 and approximately 14 gallons of water were removed from MW-5 during this development. The pump and tubing were appropriately decontaminated prior to and between use at each well. Development water was discharged on the ground surface at the well head. Monitor well MW-7 was not developed during this initial event, as the well was still dry due to slow recharge conditions.

On July 6, 2015, Buxton Environmental, Inc. conducted the development of monitor wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8. These wells were developed by raising and lowering a submersible pump equipped with polyethylene tubing across the wet portion of the well in order to break-up and remove sediments from the well. The development was conducted until the well went dry. Approximately 5-gallons of municipal tap water obtained from a Charlotte-Mecklenburg Utility Department source was introduced to monitor wells MW-2, MW-3 and MW-7, in order to enhance development of these slow recharging wells. The approximate volume of water removed from the wells during development included: 30 gallons at MW-1; 8 gallons at MW-2; 8 gallons at MW-3; 10 gallons at MW-4; 14 gallons at MW-5; 8 gallons at MW-6; 8 gallons at MW-7; and 12 gallons at MW-8. The pump and tubing were appropriately decontaminated prior to and between use at each well. Development water was discharged on the ground surface at the well head.

SAEDACCO, Inc. developed monitor well BG-1 following installation on July 30, 2015. The well was developed by raising and lowering a submersible pump equipped with polyethylene tubing across the wet portion of the well in order to break-up and remove sediments from the well. The development was conducted until the well went dry. Approximately 30 gallons of water were removed from BG-1 during development. The pump and tubing were appropriately decontaminated prior to use. Development water was discharged on the ground surface at the well head.

On September 10, 2015, Buxton Environmental, Inc. conducted additional development of monitor wells MW-2, MW-3, MW-6, and MW-7. These wells were developed with disposable PVC bailers attached to new nylon rope until the wells went dry. The approximate volume of water removed from the wells during development included: 2.5 gallons at MW-2; 10 gallons at MW-3; 20 gallons at MW-6; and 6 gallons at MW-7. Development water was discharged on the ground surface at the well head.

4.0 SURVEY OF MONITOR WELLS

The ground surface (well pad) and top-of-PVC well casing elevations (to the nearest 0.01 foot), and the horizontal locations of monitor wells MW-4, MW-5 and MW-7 were determined during the Design Hydrogeologic Report assessment by Lawrence Surveying of Monroe, North Carolina.

The ground surface (well pad) and top-of-PVC well casing elevations (to the nearest 0.01 foot), and the horizontal locations of monitor wells MW-1, MW-2, MW-3, MW-6, MW-8 and BG-1 were determined by McAdams surveying of Durham, North Carolina. The monitor well survey data from McAdams is provided in Appendix B.

A summary of the monitor well survey information is provided in Table 1.

5.0 HYDRAULIC CONDUCTIVITY DETERMINATION

On September 10, 2015, Buxton Environmental, Inc. conducted rising head slug tests at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8, in order to determine hydraulic conductivity. Hydraulic conductivity data will be utilized to determine groundwater flow velocity at each monitor well during future groundwater monitoring reports.

Prior to conducting the slug tests, static water levels were obtained at each well to the nearest 0.01 foot with a depth-to-water meter. The slug tests were conducted by lowering one or two disposable PVC bailer (s) attached to new nylon rope below the water level at each well. Water levels were allowed to equilibrate to near static conditions. A slug of water was then removed from the well by withdrawing the bailer(s) and water levels were measured with time.

The slug and recovery test data was evaluated utilizing AQTESOLV software developed by Hydrosolve, Inc. (2007) and in accordance with the methods developed by Bouwer and Rice in 1976 and 1987 (update). The Bouwer-Rice method utilized to evaluate the slug test data was developed to determine the hydraulic conductivity of the aquifer immediately surrounding the screened portion of partially or fully penetrating wells in unconfined aquifers. The rising head slug test data, and corresponding hydraulic conductivity results are provided in Appendix C. A summary of compliance monitor well details and hydraulic conductivities is presented in Table 1.

A copy of this report should be submitted to the NCSWS by HDR for their records.

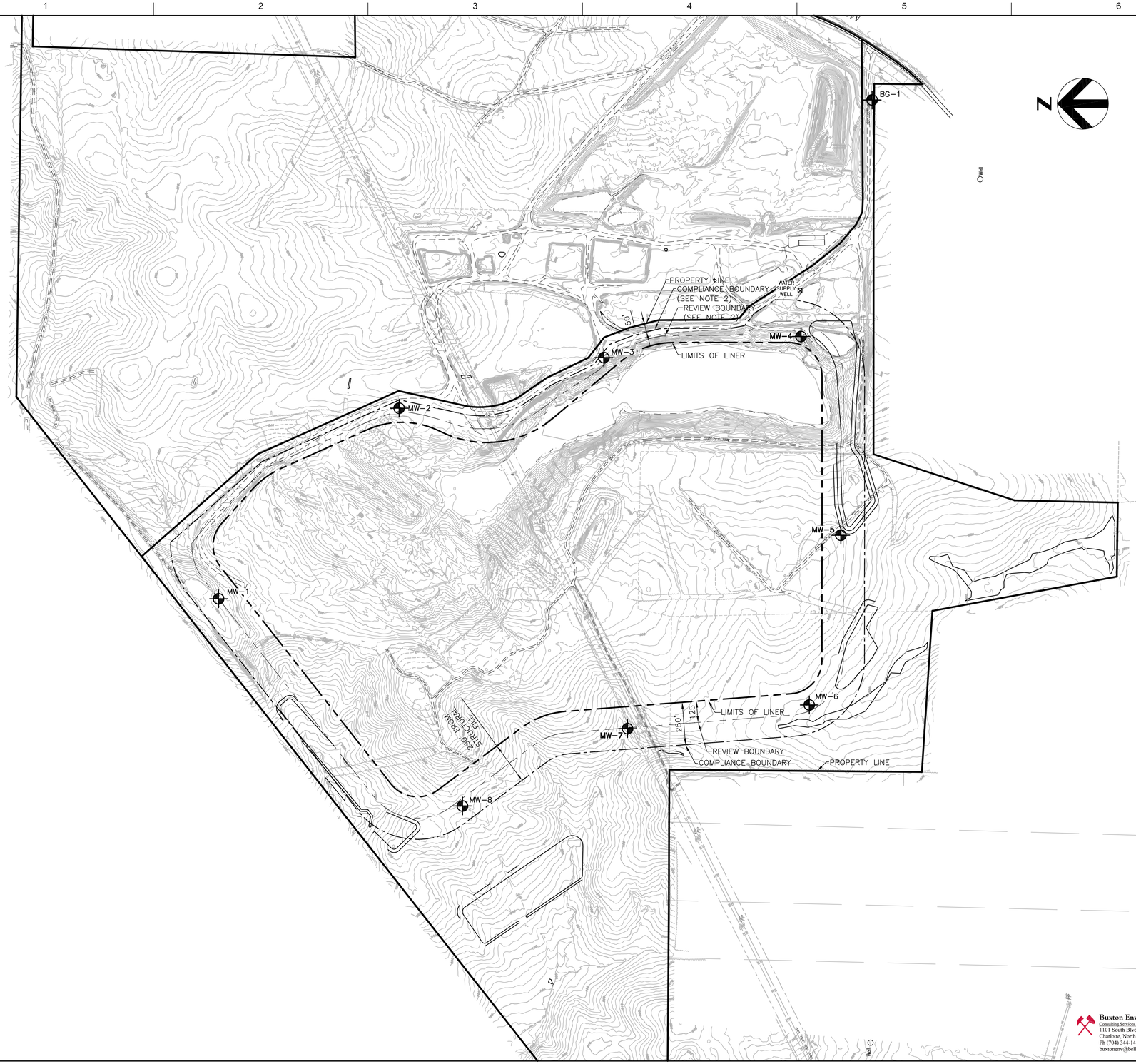
If you have any further questions concerning these matters, please give me a call at (704) 344-1450.

Sincerely,
Buxton Environmental, Inc.

Ross Klingman, P.G.
President

NORTH CAROLINA
LICENSED
SEAL
1266
10-7-15
GEOLOGIST
CHARLES ROSS KLINGMAN

FIGURES



NOTES:

1. SURVEY BASE MAP PREPARED BY LAWRENCE ASSOCIATES OF MONROE DATED SEPT 5, 2014.
2. IN AREAS WHERE THE STRUCTURAL FILL (I.E. PROPOSED LIMITS OF LINER) IS CLOSER THAN 250 FEET TO THE PROPERTY LINE, THE COMPLIANCE BOUNDARY IS SET AT 50 FEET FROM THE PROPERTY LINE. IN THESE AREAS, THE REVIEW BOUNDARY IS SET AT HALF THE DISTANCE BETWEEN THE STRUCTURAL FILL AND THE COMPLIANCE BOUNDARY.
3. REFER TO FIGURE 1 IN THE DESIGN HYDROGEOLOGIC REPORT FOR THE SURFACE WATER MONITORING LOCATIONS., SW-1 AND SW-2.
4. MONITOR WELL LOCATIONS SURVEYED BY LAWRENCE SURVEYING OF MONCURE, NC AND McADAMS OF DURHAM, NC.

LEGEND

- COMPLIANCE GROUNDWATER MONITORING WELL
- COMPLIANCE BOUNDARY
- REVIEW BOUNDARY
- STRUCTURAL FILL / LINER LIMITS

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

HDR Engineering Inc.
of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
C	10/2/15	REVISED TO SHOW BG-1 AND NOTE 4
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. KLINGMAN, P.G.
DRAWN BY	J. GAUL
CHECKED BY	
PROJECT NUMBER	453925-237673-018

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN, PG

Charah®

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

WATER QUALITY MONITORING PLAN

0 1" 2"

FILENAME 01G-14.dwg
SCALE 1"=300

SHEET
FIGURE 7

C:\pwworking\hdr\d0505088\01G-14.dwg, Plot, 10/5/2015 11:01:17 AM, jgaul

TABLES

TABLE 1
COMPLIANCE MONITOR WELL DETAILS AND HYDRAULIC CONDUCTIVITIES
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Well ID	*Northing*	*Easting*	*Pad Elev. (ft)*	*TOC Elev. (ft)*	*TD BGS (ft)*	*TD BTOC (ft)*	*Screen Length (ft)*	*Screen Interval (ft)*	*Lithologic Unit*	*Method for Determining Hydraulic Conductivity*	*Hydraulic Conductivity (cm/sec)*
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	Layered Rock/PWR*	slug test	7.761×10^{-5}
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	Layered Rock/PWR*	slug test	4.105×10^{-4}
MW-2	673677.07	1994537.54	227.45	229.97	45.00	47.52	15	197.45 - 182.45	Layered Rock/PWR*	slug test	3.405×10^{-6}
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	PWR	slug test	4.076×10^{-7}
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	Residuum/PWR	slug test	1.413×10^{-4}
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	PWR	slug test	8.010×10^{-6}
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	216.63 - 201.63	Residuum/PWR	slug test	1.097×10^{-4}
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	Residuum/PWR	slug test	1.264×10^{-6}
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	PWR	slug test	1.289×10^{-4}

Notes:

Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.

Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.

TD=total depth;BGS=below ground surface;TOC=top of casing

Hydraulic conductivity values determined by Buxton Environmental, Inc. on September 10, 2015 by conduting rising head slug tests; and solved utilizing the Bouwer-Rice (unconfined slug test) solution with AQTESOLV for Windows Version 4.50 software by Hydrosolv, Inc. (1996-2007).

* = interpreted lithologic unit based on relative drilling hardness during well installation

APPENDIX A
BORING LOGS AND WELL CONSTRUCTION RECORDS (Form GW-1)

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-1

Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

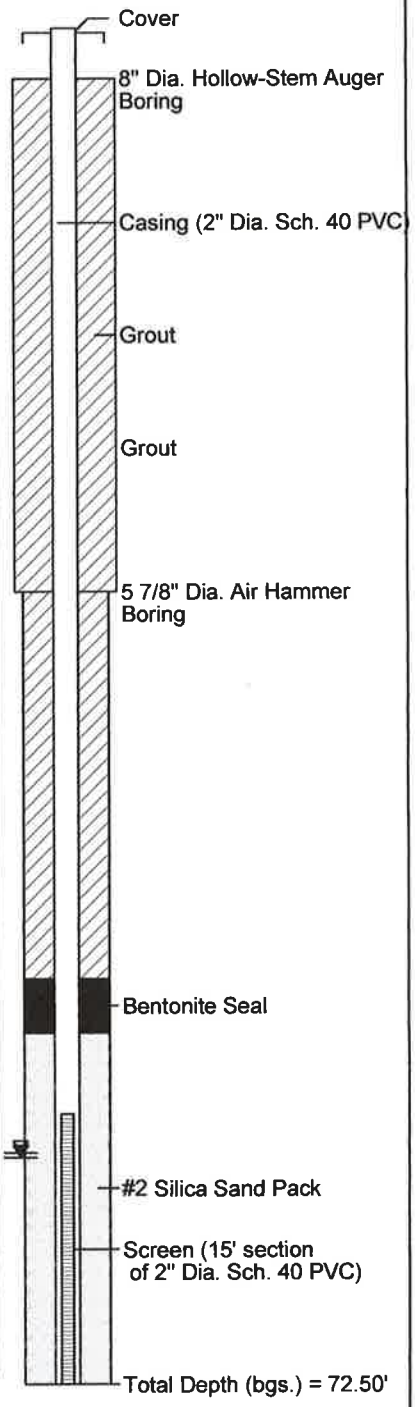
Date Started:	: 6/19/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/22/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 280.08' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 277.28' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	slight cut

Water Levels
- 1 Hour = 59.90' bgs
- 24 Hours = 59.65' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	277.28				
5	272.28	3 5 6	SS	16	moist; stiff; reddish yellow (7.5YR 6/8) with light gray and rust mottles; silty clay with quartz gravel; cohesive; high plasticity; Soil Horizon
10	267.28	6 10 19	SS	16	moist; very stiff; dark reddish brown (2.5YR 3/4) with light tan and gray specks; horizontal fissile; silty clay; cohesive; medium plasticity
15	262.28	5 10 15	SS	14	moist; very stiff; reddish brown (2.5YR 4/4); horizontal blocky fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
20	257.28	9 15 24	SS	15	moist; very stiff; reddish brown (2.5YR 4/4) with rust, light tan and black horizontal bands and mottles; horizontal blocky fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
25	252.28	50/4"	SS	4	dry; very hard; weak red (10R 5/2) with red mottles; horizontal fissile; weathered mudstone; Partially Weathered Rock
		50/2"	SS	3	
30	247.28				dry; very hard; weak red (10R 5/2) with red mottles; horizontal fissile; weathered mudstone; Partially Weathered Rock; Auger Refusal @ 28.5'
35	242.28		cuttings		moist; reddish gray (5YR 5/2); silty fine to coarse sand; hard drilling
40	237.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; medium drilling
45	232.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; hard drilling
50	227.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; hard drilling
55	222.28		cuttings		dry; reddish brown (2.5YR 5/4); silt with fine to coarse mudstone fragments; hard drilling
60	217.28		cuttings		dry; reddish brown (2.5YR 4/4); medium sandy silt; medium drilling
65	212.28		cuttings		dry; pale red (2.5YR 6/2); medium sandy silt; hard drilling
70	207.28		cuttings		wet; reddish brown (2.5YR 5/4); medium sandy silt; very hard drilling
75			cuttings		wet; reddish brown (2.5YR 5/4); medium sandy silt; v. hard drilling

Well: MW-1
TOC Elev.: 280.08'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

For Internal Use ONLY:

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐Agricultural
- ☐Municipal/Public
- ☐Geothermal (Heating/Cooling Supply)
- ☐Residential Water Supply (single)
- ☐Industrial/Commercial
- ☐Residential Water Supply (shared)
- ☐Irrigation

Non-Water Supply Well:

- ☒Monitoring
- ☐Recovery

Injection Well:

- ☐Aquifer Recharge
- ☐Groundwater Remediation
- ☐Aquifer Storage and Recovery
- ☐Salinity Barrier
- ☐Aquifer Test
- ☐Stormwater Drainage
- ☐Experimental Technology
- ☐Subsidence Control
- ☐Geothermal (Closed Loop)
- ☐Tracer
- ☐Geothermal (Heating/Cooling Return)
- ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-1

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒Permanent or ☐Temporary

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 72 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: _____ (in.)

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	57' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
57' ft.	72' ft.	2' in.	.012	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	53' ft.	portland	trimmie
53' ft.	55' ft.	bentonite chips	pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
55' ft.	72' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	24' ft.	tan silty clay
24' ft.	72' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KL NOMAN 9-25-15

21. REMARKS

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor

6/25/2015
Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program, 1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-2

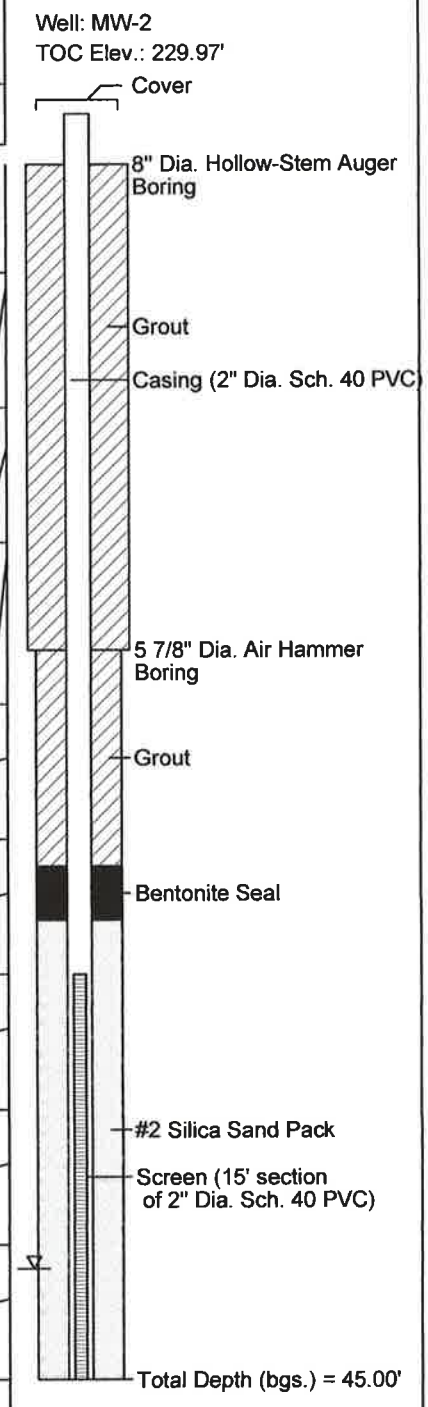
Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 6/22/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/22/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 229.97' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 227.45' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 41.18' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	227.45				
5	222.45	50/5"	SS	6	dry; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Partially Weathered Rock
10	217.45	12 25 30	SS	16	moist; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
15	212.45	50/5"	SS	3	moist; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Partially Weathered Rock; Auger Refusal @ 18'
20	207.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
25	202.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
30	197.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
35	192.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
40	187.45		cuttings		moist; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; medium drilling
45	182.45		cuttings		moist; gray (7.5 6/1); fine to coarse sandy clayey silt with mudstone fragments; medium drilling
50					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-2

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 45 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	30' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
30' ft.	45' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	26' ft.	portland	trimmie
26' ft.	28' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
28' ft.	45' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	16' ft.	tan silty clay
16' ft.	45' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-3

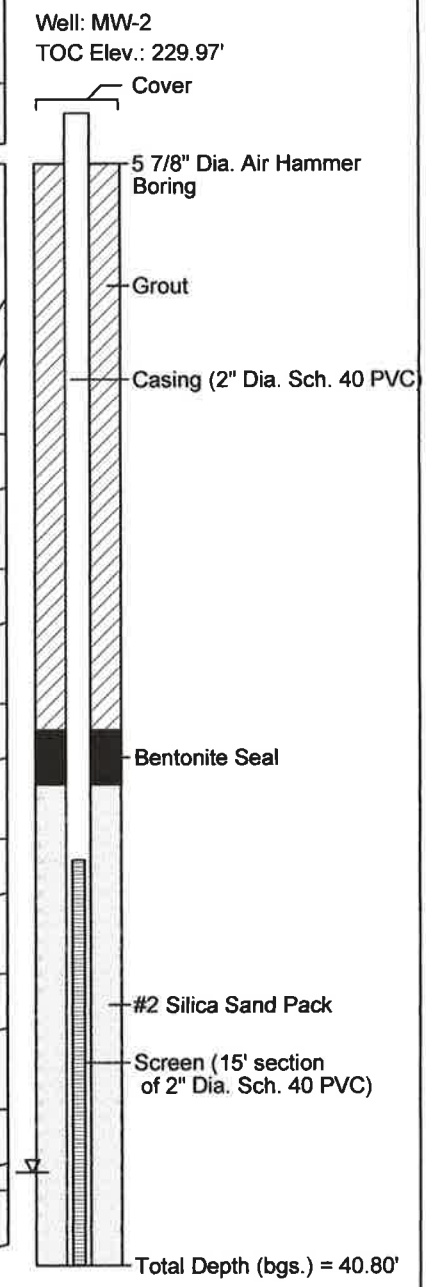
Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 6/23/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/23/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 222.56' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 220.00' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	fill; ~120' NW PZM-2/2D

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 37.10' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	220				See Boring Log PZM-2 and 2D for detailed hollow-stem auger and split spoon sampling data (attached). MW-3 is located ~120' NW of PZM-2 and 2D.
5	215		cuttings		moist; reddish yellow (7.5 YR 6/8); fine sandy clayey silt; soft drilling
10	210		cuttings		dry; brown (7.5YR 5/4); fine to medium sandy clayey silt; soft drilling
15	205		cuttings		dry; brown (7.5YR 5/3); fine to medium sandy clayey silt; soft drilling
20	200		cuttings		dry; brown (7.5YR 5/3); fine to medium sandy clayey silt; soft drilling
25	195		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
30	190		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
35	185		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
			cuttings		dry; pinkish gray (5YR 6/2); fine to medium sandy clayey silt; soft drilling
40	180				
45	175				
50					



Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-2 and 2D

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

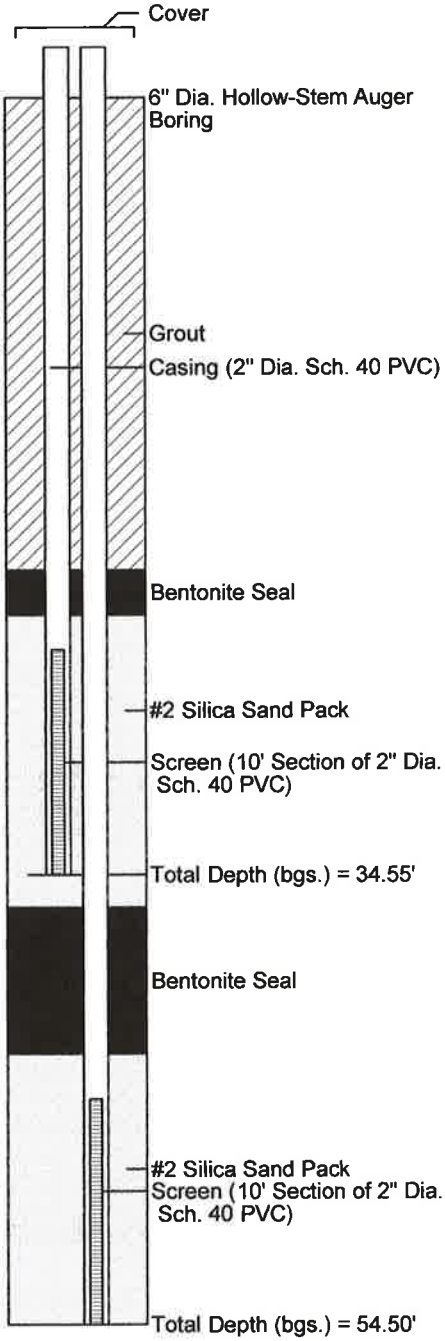
Date Started:	: 8/6/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/6/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: HPC Land Services	Top-of-Casing Elev.:	: 222.37'/222.40'
Drillers Name:	: Jason Cain	Ground Surface Elev.:	: 219.73
NC Driller Certification:	: 3112A	Natural, Cut, Fill Grade::	fill, road bed

Water Levels
- 1 Hour = 32.00' bgs/dry
- 24 Hours = 16.76'/29.49' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	219.73	9 7 13	SS	10	moist/dry; very stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly clayey silt; no plasticity; cohesive; Fill
5	214.73	4 3 6	SS	8	wet; stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly silty clay with brick fragments; no plasticity; cohesive; Fill
10	209.73	3 5 8	SS	16	moist; stiff; light brownish gray (10YR 6/2) with orange mottles; silty fat clay with roots; high plastcity; cohesive; Soil Horizon
15	204.73	4 11 12	SS	24	moist; very stiff; reddish brown (5YR 4/4) with black mottles; medium horizontal fissile; silty clay; low plasticity; Residuum
20	199.73	50/4"	SS	8	moist; reddish gray (5YR 5/2); highly horizontal fissile; clayey silt; no plasticity; cohesive; Partially Weathered Rock
25	194.73	50/6"	SS,BAG	10	moist; very hard; reddish gray (5YR 5/2) with green flecks; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-2 Bag (23.5-24); USCS=CL; Gravel=4.7%; Sand=19.9%; Silt=50.3%; Clay=25.1%; Effective Porosity=5%; Atterberg Limits: PL=20, LL=38, PI=18)
30	189.73	50/4"	SS	8	moist; very hard; reddish gray (5YR 5/2) with green flecks; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
35	184.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
40	179.73	50/1"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
45	174.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50	169.73	50/3"	SS	8	dry; very hard; dark reddish gray (5/YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
55	164.73	50/3"	SS	4	dry; vary hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
60					

Well1: PZM-2
Well2: PZM-2D
TOC Elev.:



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐ Agricultural ☐ Municipal/Public
☐ Geothermal (Heating/Cooling Supply) ☐ Residential Water Supply (single)
☐ Industrial/Commercial ☐ Residential Water Supply (shared)
☐ Irrigation

Non-Water Supply Well:
☒ Monitoring ☐ Recovery

Injection Well:
☐ Aquifer Recharge ☐ Groundwater Remediation
☐ Aquifer Storage and Recovery ☐ Salinity Barrier
☐ Aquifer Test ☐ Stormwater Drainage
☐ Experimental Technology ☐ Subsidence Control
☐ Geothermal (Closed Loop) ☐ Tracer
☐ Geothermal (Heating/Cooling Return) ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-3

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒ **Permanent** or ☐ **Temporary**

7. Is this a repair to an existing well: ☐ **Yes** or ☒ **No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 40 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	25' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
25' ft.	40' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	~~20'~~ 21' ft.	portland	trimmie
21' ft.	23' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
23' ft.	40' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	40' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

21. REMARKS

22. Certification:

Steve Poloniewicz — 6/25/2015
Signature of Certified Well Contractor — Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-1 / MW-4

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

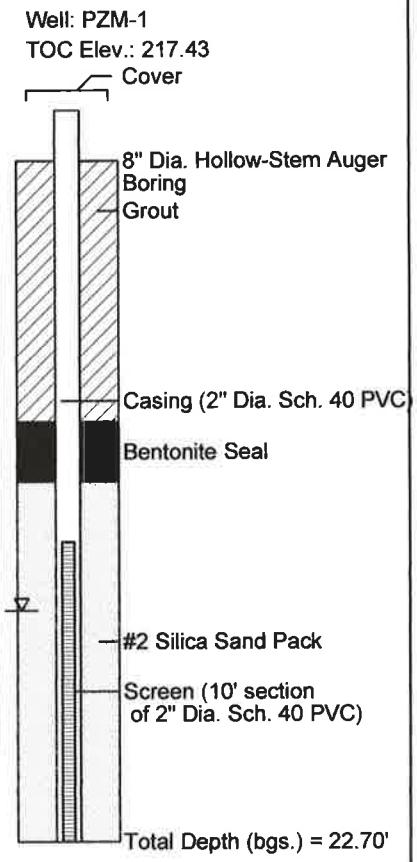
Date Started:	: 8/13/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/13/14	Drilling Method:	: Geoprobe 8049DT
Drilling Company:	: Geologic Exploration	Top-of-Casing Elev.:	: 217.13'(Lawrence Survey)
Drillers Name:	: Johnny Burr	Ground Surface Elev.:	: 214.49'(Lawrence Survey)
NC Driller Certification:	: 3098A	Natural, Cut, Fill Grade:	: Fill (road bed)

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 15.00' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	214.49	4 14 12	SS	14	moist; very stiff; reddish yellow (7.5YR 6/6) with orange, yellow and light gray mottled; fine sandy silty clay with quartz gravel; low plasticity; cohesive; Fill
5	209.49	4 5 6	SS	9	moist; stiff; strong brown (7.5YR 5/6) with light gray and brown mottled; medium sandy silty clay with brick and quartz gravel; medium plasticity; cohesive; Fill
10	204.49	7 5 4	SS,BAG	12	moist; stiff; gray (5YR 6/1) with light orange mottles; very fine sandy coarse silty clay; low plasticity; cohesive; Flood Plain; (Lab Results: PZ-1 Bag (9-10.5'); USCS=CL; Gravel=0.3%; Sand=33.4%; Silt=38.7%; Clay=27.6%; Effective Porosity=5%; Atterberg Limits: PL=18; LL=34, PI=16)
15	199.49	7 10 50/5"	SS,BAG	13	moist/wet; reddish brown (5YR 4/3) with gray mottles; fine sandy silty clay; medium plasticity; cohesive; Residuum; (Lab Results: PZM-1 Bag (14.5-16'); USCS=CL; Gravel=0.1%; Sand=49.6%; Silt=33.1; Clay=17.2%; Effective Porosity=14%; Atterberg Limits: PL=16; LL=24; PI=8)
20	194.49	16 50/2"	SS	6	dry; light gray (5YR 7/1); horizontal fissle weathered mudstone; Partially Weathered Rock
25	189.49				
30	184.49				
35	179.49				
40	174.49				
45					

Auger Refusal @ 22.7'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

JOHNNY BURR

Well Contractor Name

A - 3098

NC Well Contractor Certification Number

GEOLOGIC EXPLORATION, INC

Company Name

2. Well Construction Permit #: _____

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public

☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)

☐Industrial/Commercial ☐Residential Water Supply (shared)

☐Irrigation

Non-Water Supply Well:

☑Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation

☐Aquifer Storage and Recovery ☐Salinity Barrier

☐Aquifer Test ☐Stormwater Drainage

☐Experimental Technology ☐Subsidence Control

☐Geothermal (Closed Loop) ☐Tracer

☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 08/13/14 **Well ID#** PZM-1 / MW-4 CSR

5a. Well Location:

MONCURE MINE

Facility/Owner Name

Facility ID# (if applicable)

1315 MONCURE-FLATWOOD ROAD MONCURE 27559

Physical Address, City, and Zip

CHATHAM

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35° 38' 36.98" N 79° 00' 04.99" W

6. Is (are) the well(s): ☑**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 22.0 (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: 10.0 (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8.0 (in.)

12. Well construction method: AUGER

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	12.0 ft.	2.0 in.	SCH 40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
12.0 ft.	22.0 ft.	2.0 in.	.010	SCH 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0.0 ft.	8.0 ft.	PORTLAND BENTONITE	SLURRY
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
10.0 ft.	22.0 ft.	20-40	FINE SILICA SAND
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	22.0 ft.	BROWN PWR
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

BENTONITE SEAL FROM 8.0 TO 10.0 FEET

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLNOLAN

22. Certification:

Johnny Burr

Signature of Certified Well Contractor

08/18/14

Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-22 / MW-5

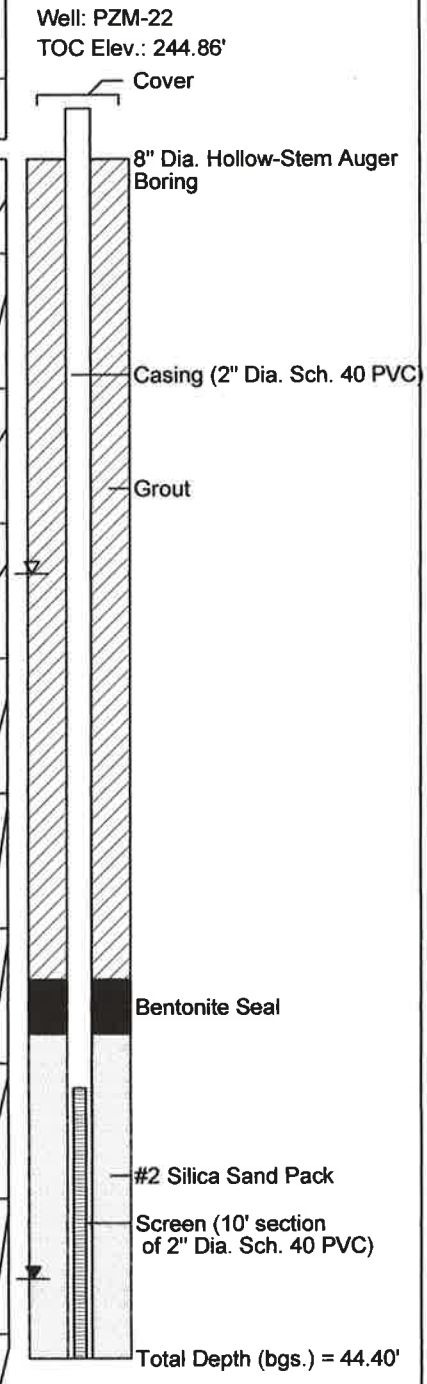
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 11/25/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 11/25/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 244.86'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 242.72'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
1 Hour = 43.60' bgs
24 Hours = 17.50' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	242.72	0 0 3	SS	20	wet; very soft; brownish yellow (10YR 6/8); silty clay with organic matter; high plasticity; cohesive; Soil Horizon
5	237.72	4 4 5	SS	12	very moist; stiff; brownish yellow (10YR 6/8) with rust stringers; silty clay with organic matter; high plasticity; cohesive; Soil Horizon
10	232.72	5 7 8	SS	16	moist; stiff; light gray (5Y 7/1) with light orange and rust specks and mottles; silty clay; medium plasticity; cohesive; Soil Horizon
15	227.72	14 22 34	SS	22	moist; very hard; weak red (10R 4/3) with light green and brown mottles; blocky; silty clay; no plasticity; cohesive; Residuum
20	222.72	14 18 22	SS	23	moist; hard; weak red (10R 4/3) with light green and rust mottles; blocky horizontal fissile; silty clay; no plasticity; cohesive; Residuum
25	217.72	50/6"	SS	12	dry; very hard; reddish brown (5YR 5/3) with light gray mottles; highly horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
30	212.72	50/5"	SS	6	dry; very hard; reddish brown (5YR 5/3) with light gray mottles; wavey horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
35	207.72	50/2"	SS	6	moist; very hard; pinkish gray (7.5YR 6/2); medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
40	202.72	50/5"	SS	6	dry; very hard; light yellowish brown (2.5Y 6/3); medium horizontal fissile; fine to medium sandy silt; no plasticity; cohesive; Partially Weathered Rock
45	197.72	50/5"	SS	4	moist; very hard; dark gray (2.5Y 4/1); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Cassell jr.

Well Contractor Name

4143-A

NC Well Contractor Certification Number

Summit-ECS

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public

☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)

☐Industrial/Commercial ☐Residential Water Supply (shared)

☐Irrigation

Non-Water Supply Well:

☑Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation

☐Aquifer Storage and Recovery ☐Salinity Barrier

☐Aquifer Test ☐Stormwater Drainage

☐Experimental Technology ☐Subsidence Control

☐Geothermal (Closed Loop) ☐Tracer

☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 11/25/14 **Well ID#** pzm-22/mw-5 OTK

5a. Well Location:

Facility/Owner Name _____ Facility ID# (if applicable) _____

1315 Moncure-Flatwood rd.

Physical Address, City, and Zip

Chatham

County _____ Parcel Identification No. (PIN) _____

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 44' (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8.25" (in.)

12. Well construction method: HSA

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
34.0' ft.	+2' ft.	2" in.	.040	pvc
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
44.0' ft.	34.0' ft.	2" in.	.010	.040	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
32.0' ft.	30.0' ft.	bent.	well seal
30.0' ft.	0.0' ft.	port.	trimmie
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
44.0' ft.	32.0' ft.	well sand	trickle down
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1.4 ft.	top soil
1.4 ft.	ft.	
ft.	6.0 ft.	tan fi sa si
6.2 ft.	ft.	brn, reddish tri si
ft.	ft.	
ft.	ft.	
ft.	45.0' ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

22. Certification:

Signature of Certified Well Contractor _____ Date 12-15-14

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:

Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-6

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

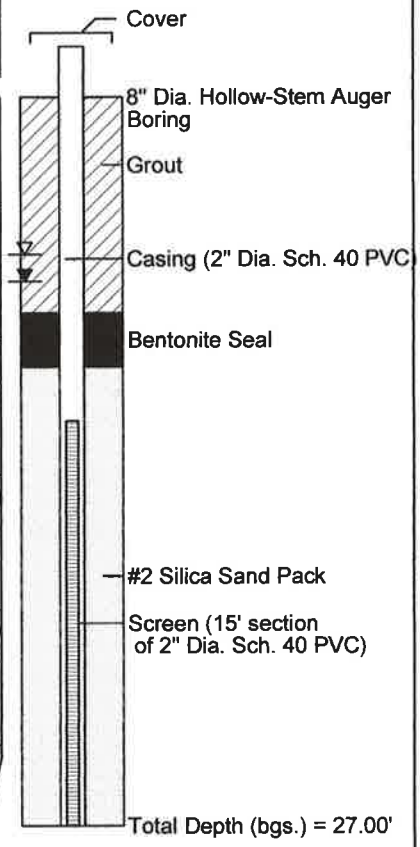
Date Started:	: 6/23/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/23/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 231.10'(McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 228.63'(McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	Natural

Water Levels
- 1 Hour = 6.40' bgs
- 24 Hours = 5.40' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	228.63				
5	223.63	9 20 24	SS	14	moist; hard; reddish brown (2.5YR 4/3); horizontal fissile; weathered mudstone and clayey silt; cohesive; no plasticity; Residuum
10	218.63	11 31 15	SS	16	dry; hard; weak red (10R 5/3) with horizontal orange tan and light green bands; silty clay; cohesive; medium plasticity; Residuum
15	213.63	50/5"	SS	6	moist; very hard; dusky red (2.5YR 3/2) with fine light grat and tan specks; clayey fine to coarse sandy silt; no cohesion or plasticity; Partially Weathered Rock
20	208.63	50/3"	SS	6	dry; very hard; weak red (2.5YR 5/2); weathered mudstone; Partially Weathered Rock
25	203.63	50/3"	SS	5	wet; very hard; weak red (2.5YR 5/2); weathered mudstone; Partially Weathered Rock
30	198.63				
35	193.63				
40	188.63				
45	183.63				
50					

Well: MW-6
TOC Elev.: 231.10'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/23/2015 **Well ID#** MW-6

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 26 **(ft.)**
For multiple wells list all depths if different (example: 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	12' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
12' ft.	27' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	8' ft.	portland	trimmie
8' ft.	10' ft.	bentonite chips	pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
10' ft.	27' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	27' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 9-25-15

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-27 / MW-7

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

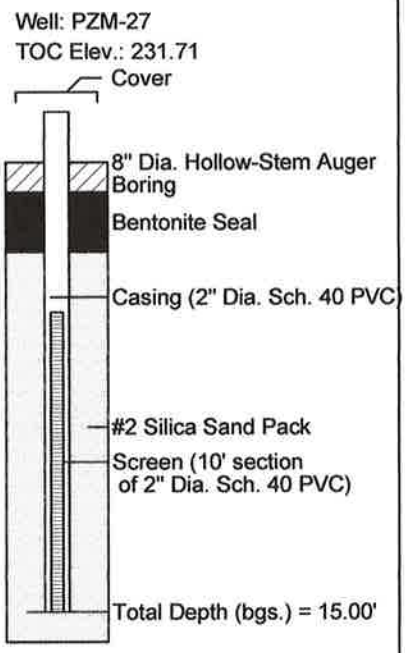
Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 231.71'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 229.53'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natual

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	229.53	1 2 3	SS	15	moist; medium; yellowish brown (10YR 5/6) with light orange mottles; silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	224.53	6 9 12	SS	14	moist; very stiff; dark reddish brown (2.5YR 3/3) with dark gray and white specks; fine to medium sandy silty clay; low plasticity; cohesive; Residuum
10	219.53	25 50/3"	SS	12	dry; very hard; reddish gray (2.5YR 5/1) with light orange and rust mottles; slightly clayey ine to medium sand; no plasticity; cohesive; Partially Weathered Rock
15	214.53	50/4"	SS	6	moist; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; fine to medium sandy clayey silt; very hard drilling 11-13'; no plasticity; cohesive; Partially Weathered Rock
20	209.53				
25	204.53				
30	199.53				
35	194.53				
40	189.53				
45					

Auger Refusal @ 16'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Cassell jr.

Well Contractor Name

4143-A

NC Well Contractor Certification Number

Summit-ECS

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐Agricultural
- ☐Municipal/Public
- ☐Geothermal (Heating/Cooling Supply)
- ☐Residential Water Supply (single)
- ☐Industrial/Commercial
- ☐Residential Water Supply (shared)
- ☐Irrigation

Non-Water Supply Well:

- ☑Monitoring
- ☐Recovery

Injection Well:

- ☐Aquifer Recharge
- ☐Groundwater Remediation
- ☐Aquifer Storage and Recovery
- ☐Salinity Barrier
- ☐Aquifer Test
- ☐Stormwater Drainage
- ☐Experimental Technology
- ☐Subsidence Control
- ☐Geothermal (Closed Loop)
- ☐Tracer
- ☐Geothermal (Heating/Cooling Return)
- ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 12/2/14 **Well ID#** pzm-27 / mw-7 CZK

5a. Well Location:

Facility/Owner Name _____ Facility ID# (if applicable) _____

1315 Moncure-Flatwood rd.

Physical Address, City, and Zip

Chatham

County _____ Parcel Identification No. (PIN) _____

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 15.0' **(ft.)**

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**

If water level is above casing, use "+"

11. Borehole diameter: 8.25" **(in.)**

12. Well construction method: HSA

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
5.0' ft.	+2' ft.	2" in.	.040	pvc
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15.0' ft.	5.0' ft.	2" in.	.010	.040	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
3.0' ft.	2.0' ft.	bent.	well seal
2.0' ft.	0.0' ft.	port.	trimmie
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
15.0' ft.	3.0' ft.	well sand	trickle down
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	.7 ft.	top soil
.7 ft.	ft.	
ft.	4.0 ft.	tan fi sa si
4.2 ft.	ft.	brn, reddish , tri si
ft.	ft.	
ft.	ft.	
ft.	15.0' ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLNOMAN

22. Certification:

Signature of Certified Well Contractor _____ Date 12-15-14

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:

Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-8

Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

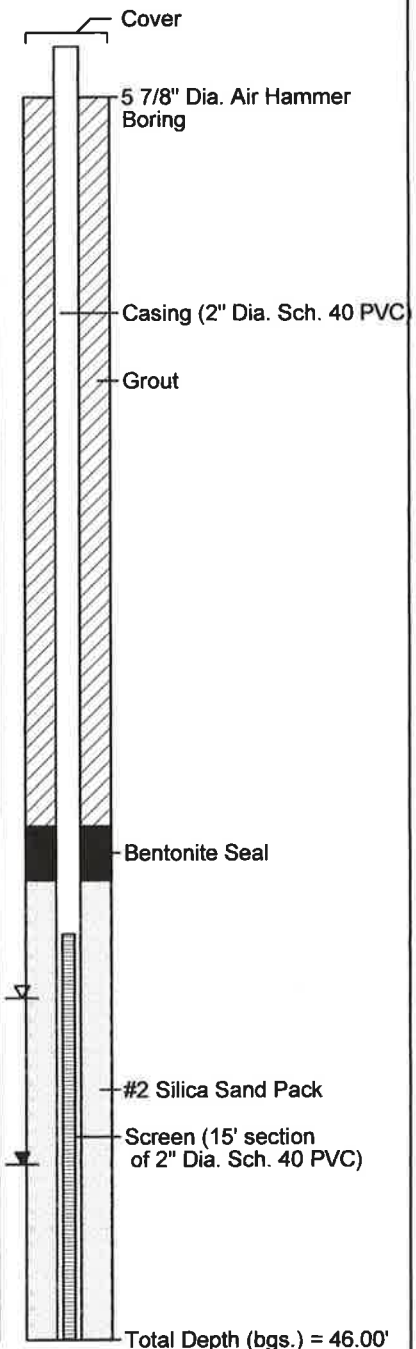
Date Started:	: 6/24/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/24/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 236.47' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 233.41' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	natural; 15' N. PZM-28

Water Levels
▼ 1 Hour = 39.50' bgs
▽ 24 Hours = 33.36' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	233.41				See Boring Log PZM-28 for detailed hollow-stem auger and split spoon sampling data from 0-24' bgs (attached). MW-8 is located 15' N. of PZM-28.
5	228.41				
10	223.41				
15	218.41				
20	213.41				
25	208.41		cuttings		dry; yellowish red (5YR 5/6); silty mudstone fragments; medium hard drilling
30	203.41		cuttings		dry; reddish brown (5YR 5/4); sandy clayey silt with mudstone fragments; soft drilling
35	198.41		cuttings		dry; reddish brown (5YR 5/4); sandy clayey silt with mudstone fragments; medium hard drilling
40	193.41		cuttings		wet; reddish brown (5YR 4/3); medium sand silt with mudstone fragments; soft drilling
45	188.41		cuttings		wet; reddish brown (5YR 4/3); medium sand silt with mudstone fragments; hard drilling
50					

Well: MW-8
TOC Elev.: 236.47'



Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-28 (Adjacent to MW-8)

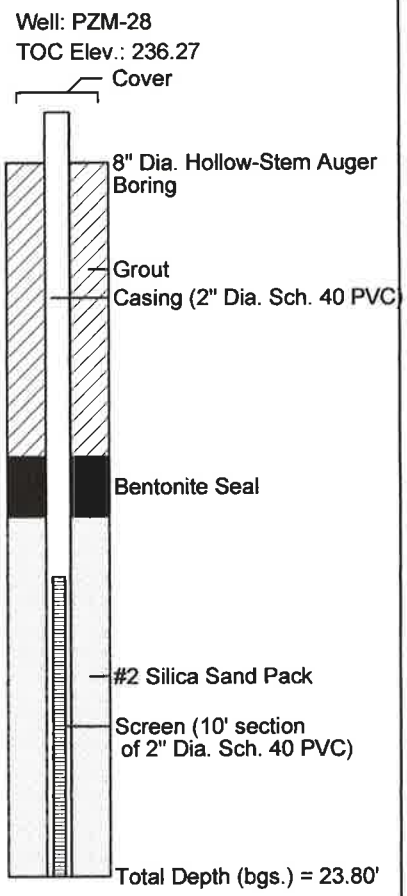
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 236.12'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 234.12'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natual; 15' S. MW-8

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	234.12	3 4 7	SS	22	moist; stiff; yellowish red (5YR 5/6) with orange mottles; fine sandy silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	229.12	16 17 26	SS	18	moist/dry; very hard; reddish brown (5YR 4/4); clayey silt; no plasticity; cohesive; Residuum
10	224.12	16 50/6"	SS	12	moist; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
15	219.12	50/6"	SS	5	dry; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
20	214.12	50/3"	SS	2	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
25	209.12	50/3"	SS	4	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
30	204.12				
35	199.12				
40	194.12				
45					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐ Agricultural
- ☐ Municipal/Public
- ☐ Geothermal (Heating/Cooling Supply)
- ☐ Residential Water Supply (single)
- ☐ Industrial/Commercial
- ☐ Residential Water Supply (shared)
- ☐ Irrigation

Non-Water Supply Well:

- ☒ Monitoring
- ☐ Recovery

Injection Well:

- ☐ Aquifer Recharge
- ☐ Groundwater Remediation
- ☐ Aquifer Storage and Recovery
- ☐ Salinity Barrier
- ☐ Aquifer Test
- ☐ Stormwater Drainage
- ☐ Experimental Technology
- ☐ Subsidence Control
- ☐ Geothermal (Closed Loop)
- ☐ Tracer
- ☐ Geothermal (Heating/Cooling Return)
- ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/24/2015 **Well ID#** MW-8

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒ Permanent or ☐ Temporary

7. Is this a repair to an existing well: ☐ Yes or ☒ No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 46 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: _____ (in.)

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	31' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
31' ft.	46' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	27' ft.	portland	trimmie
27' ft.	29' ft.	bentonite chips	pwr
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
29' ft.	46' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	46' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KL NOMAN 6-25-15

21. REMARKS

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, BG-1

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

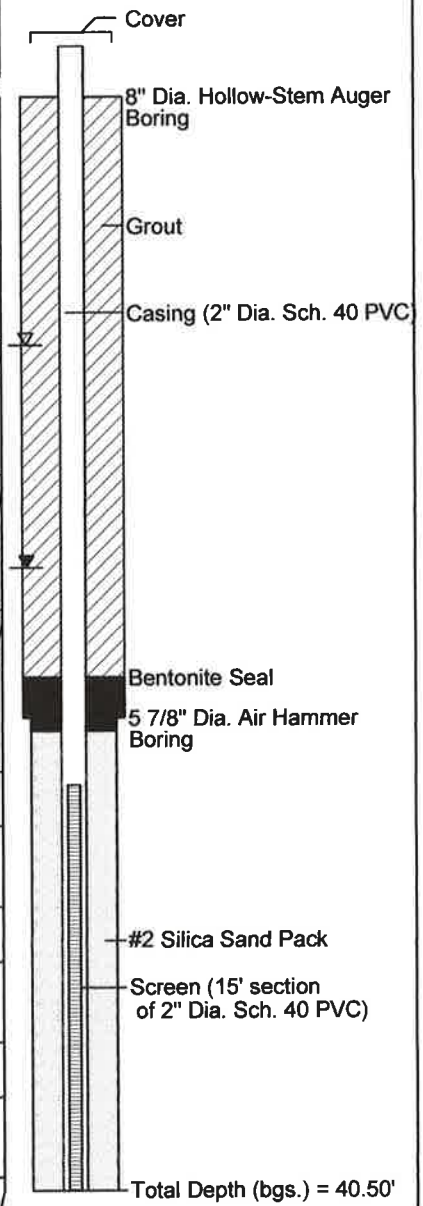
Date Started:	: 7/30/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 7/30/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 228.19' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 225.64' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	natural

Water Levels
- 1 Hour = 16.50' bgs
- 24 Hours = 9.00' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	225.64				
5	220.64	4 5 5	SS	16	moist; medium; pinkish gray (7.5YR 6/2) with light orange mottles; fine sandy silty clay; cohesive; high plasticity; Soil Horizon
10	215.64	50/4"	SS	3	dry; very hard; dark red (2.5YR 3/6); medium horizontal fissile; weathered mudstone; Partially Weathered Rock
15	210.64	50/2"	SS	3	dry; very hard; dark red (2.5YR 3/6) with gray horizontal bands; silty fine to coarse sand and muddy sandstone gravel; Partially Weathered Rock
20	205.64	50/4"	SS	6	dry; very hard; weak red (10YR 5/3); horizontal fissile; sandy mudstone; Partially Weathered Rock; Auger Refual @ 23'
25	200.64		cuttings		dry; red (10R 4/6); silt with mudstone fragments; hard drilling
30	195.64		cuttings		dry; red (10R 5/6); silt with mudstone fragments; medium hard drilling
35	190.64		cuttings		dry; red (10R 5/6); silt with mudstone fragments; medium hard drilling
40	185.64		cuttings		dry; weak red (10R 5/3); silt with mudstone fragments; hard drilling
45	180.64				
50					

Well: BG-1
TOC Elev.: 228.19'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284-A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 07/30/2015 **Well ID#** BG-1

5a. Well Location:

Moncure Clay MIne
Facility/Owner Name
Facility ID# (if applicable)

1315 Moncure-Flatwood Road, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County
Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 41 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	26' ft.	2' in.	SCH 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
26' ft.	41' ft.	2' in.	.010	SCH 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0.0 ft.	22' ft.	portland cementmmie	
22' ft.	24' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
24' ft.	41' ft.	SILICA SAND	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
o.o ft.	20' ft.	red silty clay
20' ft.	41' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 9-25-15

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor

7/31/2015
Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

APPENDIX B
MONITOR WELL SURVEY DATA – MCADAMS

Brickhaven No.2 Mine Tract A
Monitoring Well Locations

Description	Northing	Easting	Top Concrete Elev.	Top Well Casing	Top of pipe
MW-2	673677.0735	1994537.5362	227.45	230.47	229.97
MW-1~~-1D~~	674737.9802	1993417.6879	277.28	280.45	280.08
MW-3	672474.6258	1994834.7635	220.00	222.99	222.56
MW-8	673304.8301	1992200.3716	233.41	236.92	236.47
MW-6	671267.5989	1992793.3436	228.63	231.54	231.10
Guardhouse	670898.4966	1996348.2508	225.64	228.8	228.19

Notes: Well observations were take on 7/27/2015
Bearings for this survey are based on NAD 83
Elevations for this survey are based on NAVD 88

NORTH CAROLINA
PROFESSIONAL
SEAL
L-4[illegible]
LAND SURVEYOR
8/5/2015
GREGORY C. DEWLEY

APPENDIX C
RISING HEAD SLUG TEST DATA AND HYDRAULIC CONDUCTIVITY RESULTS

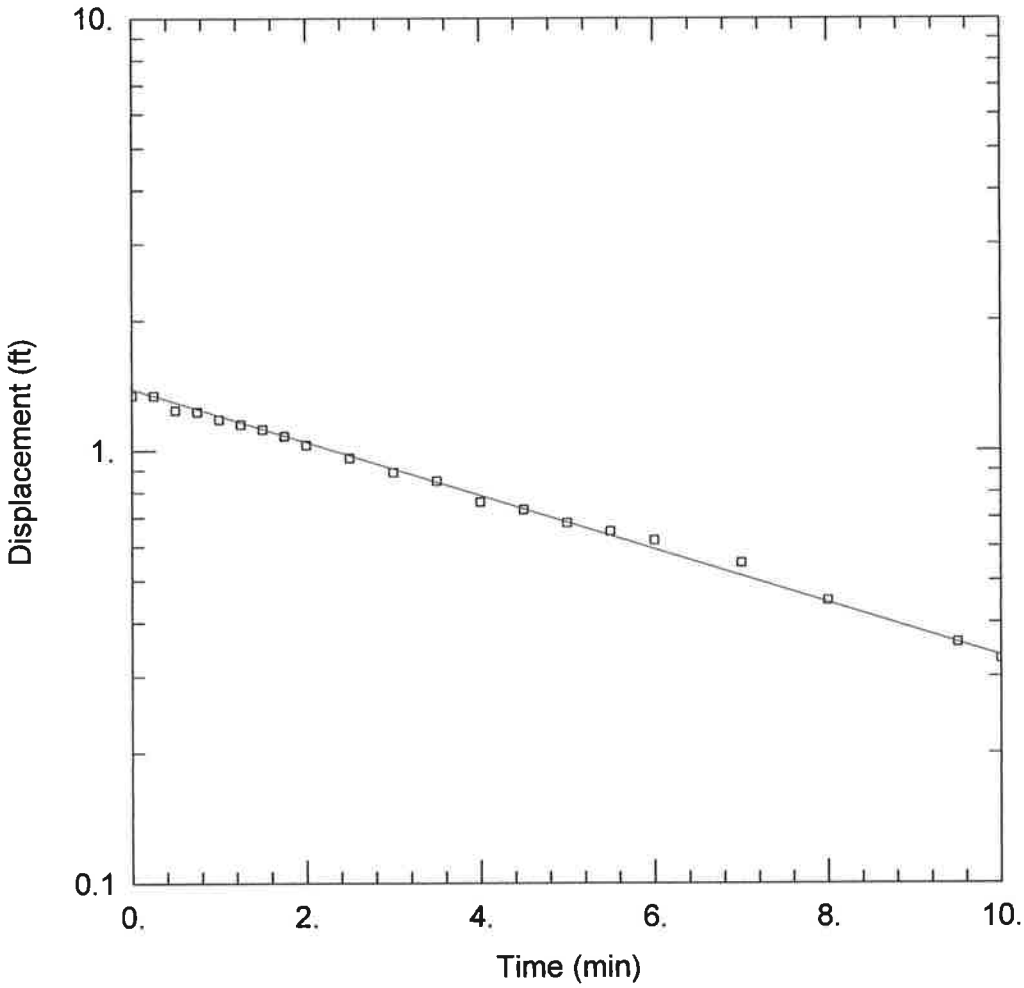
BG-1
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.34'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 40.50'
Total Depth Well Below Top-of-Casing (BTOC): 43.05'
Static Depth-to-Water BTOC: 12.46'
Static Height of Water in Well: 30.59'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	12.46		
0.25	13.80	12.46	1.34
0.50	13.70	12.46	1.24
0.75	13.69	12.46	1.23
1.00	13.64	12.46	1.18
1.25	13.61	12.46	1.15
1.50	13.58	12.46	1.12
1.75	13.54	12.46	1.08
2.00	13.49	12.46	1.03
2.50	13.42	12.46	0.96
3.00	13.35	12.46	0.89
3.50	13.31	12.46	0.85
4.00	13.22	12.46	0.76
4.50	13.19	12.46	0.73
5.00	13.14	12.46	0.68
5.50	13.11	12.46	0.65
6.00	13.08	12.46	0.62
7.00	13.01	12.46	0.55
8.00	12.91	12.46	0.45
9.50	12.82	12.46	0.36
10.00	12.79	12.46	0.33

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.BG-1



RISING HEAD SLUG TEST - BG-1

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickBG-1.aqt
Date: 09/28/15 Time: 16:44:11

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: BG-1
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 30.59 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.34 ft
Total Well Penetration Depth: 40.5 ft
Casing Radius: 0.083 ft
Static Water Column Height: 30.59 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 7.761E-5 cm/sec
y0 = 1.389 ft

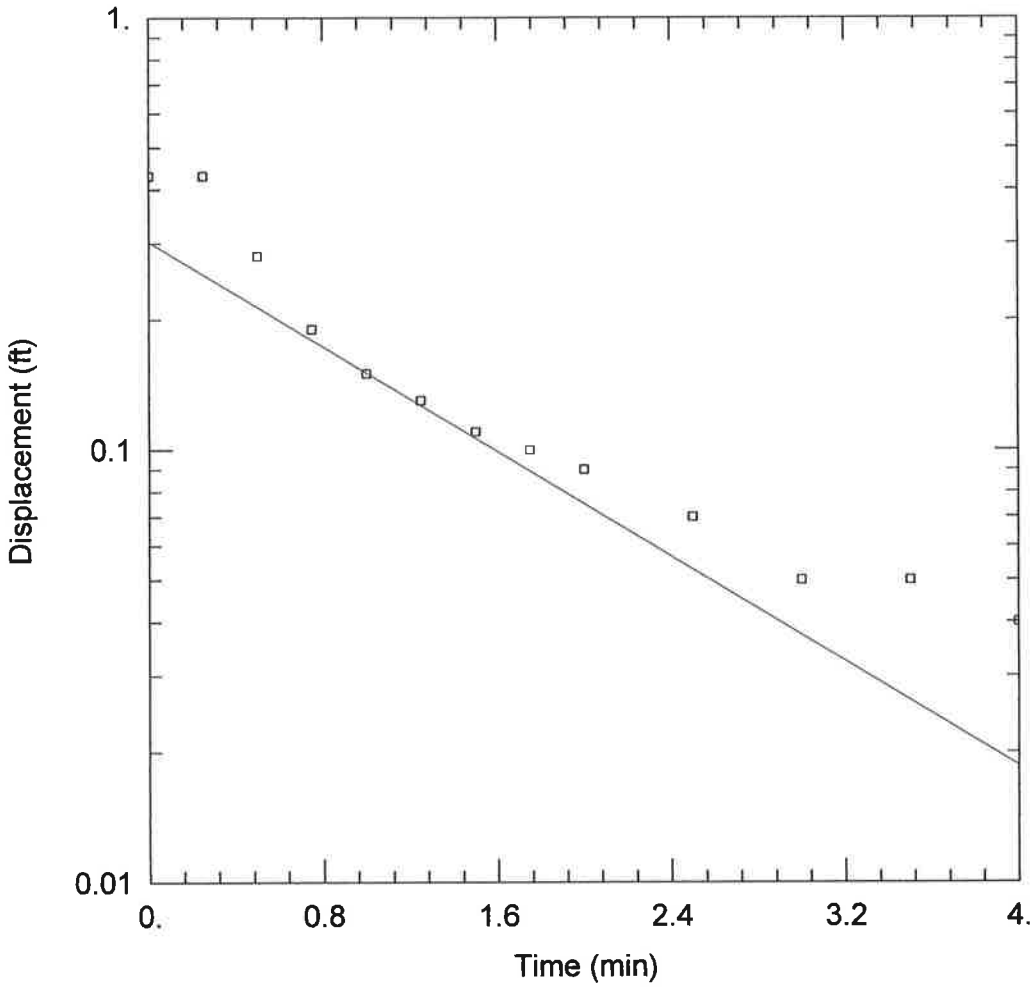
MW-1
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.43'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 72.50'
Total Depth Well Below Top-of-Casing (BTOC): 75.30'
Static Depth-to-Water BTOC: 59.97'
Static Height of Water in Well: 15.33'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	59.97		
0.25	60.40	59.97	0.43
0.50	60.25	59.97	0.28
0.75	60.16	59.97	0.19
1.00	60.12	59.97	0.15
1.25	60.10	59.97	0.13
1.50	60.08	59.97	0.11
1.75	60.07	59.97	0.10
2.00	60.06	59.97	0.09
2.50	60.04	59.97	0.07
3.00	60.02	59.97	0.05
3.50	60.02	59.97	0.05
4.00	60.01	59.97	0.04

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (2) bailers of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-1



RISING HEAD SLUG TEST - MW-1

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-1.aqt
Date: 09/28/15 Time: 15:57:06

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-1
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 15.33 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.43 ft
Total Well Penetration Depth: 72.5 ft
Casing Radius: 0.083 ft
Static Water Column Height: 15.33 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0004105 cm/sec
y0 = 0.3027 ft

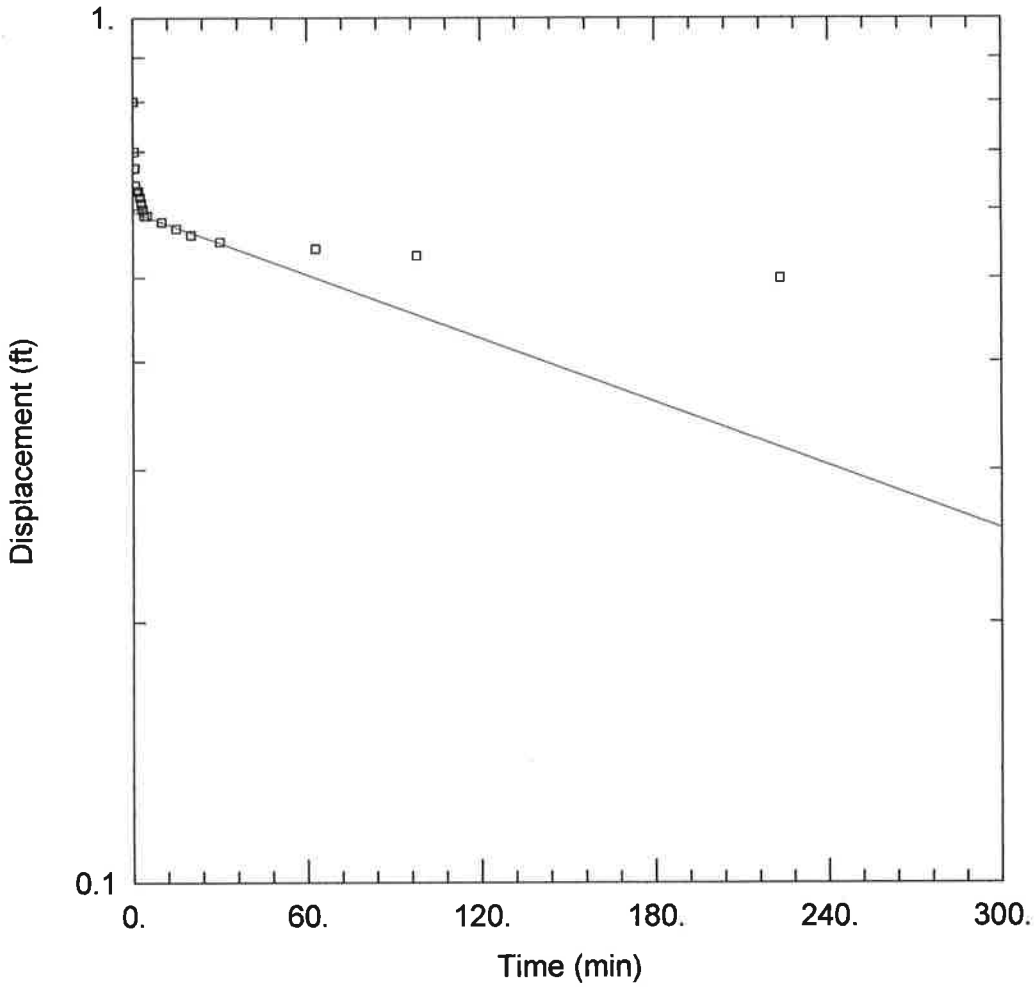
MW-2
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.80'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 45.00'
Total Depth Well Below Top-of-Casing (BTOC): 47.52'
Static Depth-to-Water BTOC: 40.98'
Static Height of Water in Well: 6.54'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	40.98		
0.25	41.78	40.98	0.80
0.50	41.68	40.98	0.70
0.75	41.65	40.98	0.67
1.00	41.62	40.98	0.64
1.50	41.61	40.98	0.63
2.00	41.61	40.98	0.63
2.50	41.60	40.98	0.62
3.00	41.59	40.98	0.61
3.50	41.58	40.98	0.60
4.00	41.57	40.98	0.59
5.00	41.57	40.98	0.59
10.00	41.56	40.98	0.58
15.00	41.55	40.98	0.57
20.00	41.54	40.98	0.56
30.00	41.53	40.98	0.55
63.00	41.52	40.98	0.54
98.00	41.51	40.98	0.53
223.00	41.48	40.98	0.50

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-2



RISING HEAD SLUG TEST - MW-2

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-1.aqt
Date: 09/28/15 Time: 16:02:26

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-2
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.8 ft
Total Well Penetration Depth: 45. ft
Casing Radius: 0.083 ft
Static Water Column Height: 6.54 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.405E-6 cm/sec
y0 = 0.5962 ft

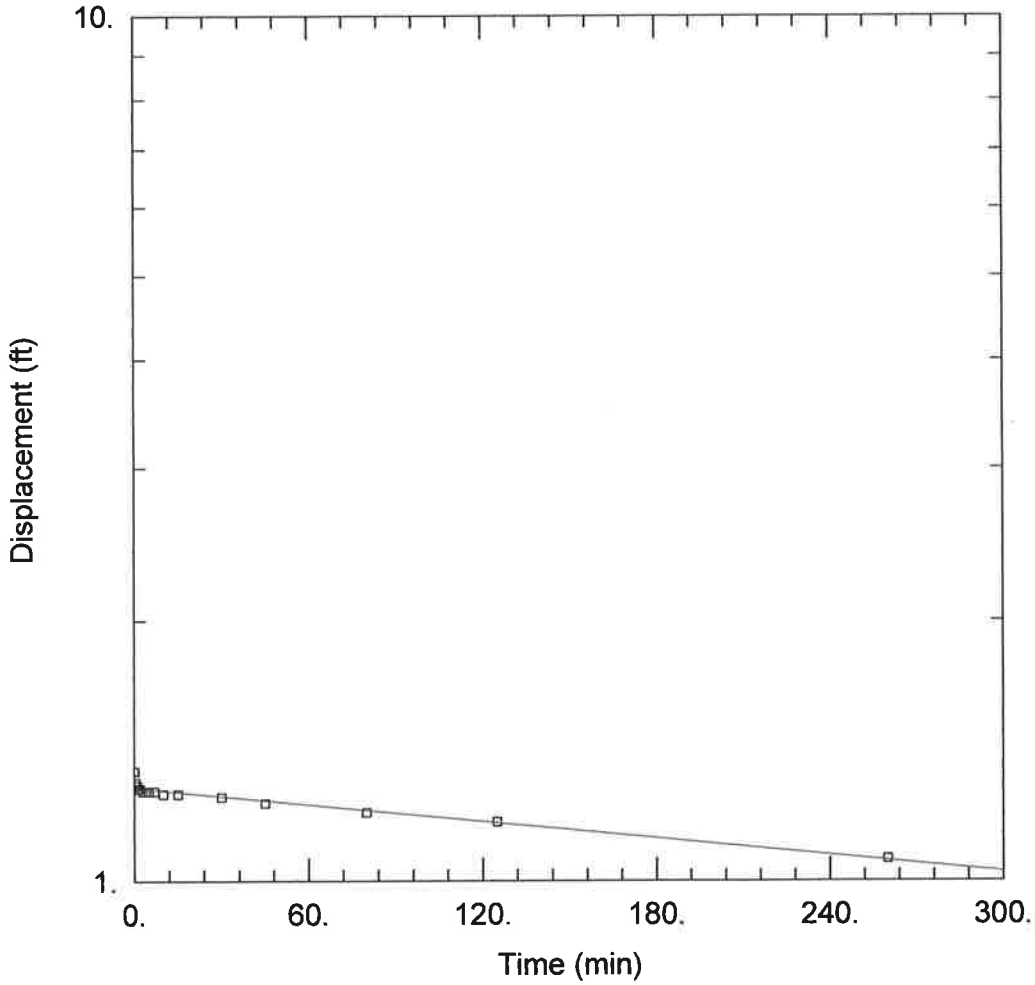
MW-3
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.34'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 40.80'
Total Depth Well Below Top-of-Casing (BTOC): 43.36'
Static Depth-to-Water BTOC: 15.55'
Static Height of Water in Well: 27.81'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	15.55		
0.25	16.89	15.55	1.34
0.50	16.85	15.55	1.30
0.75	16.84	15.55	1.29
1.00	16.84	15.55	1.29
1.50	16.83	15.55	1.28
2.00	16.83	15.55	1.28
3.00	16.82	15.55	1.27
4.00	16.82	15.55	1.27
5.00	16.82	15.55	1.27
7.00	16.82	15.55	1.27
10.00	16.81	15.55	1.26
15.00	16.81	15.55	1.26
30.00	16.80	15.55	1.25
45.00	16.78	15.55	1.23
80.00	16.75	15.55	1.20
125.00	16.72	15.55	1.17
260.00	16.61	15.55	1.06

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-3



RISING HEAD SLUG TEST - MW-3

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-3.aqt
Date: 09/28/15 Time: 16:12:02

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-3
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 27.81 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.34 ft
Total Well Penetration Depth: 40.8 ft
Casing Radius: 0.083 ft
Static Water Column Height: 27.81 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 4.076E-7 cm/sec
y0 = 1.281 ft

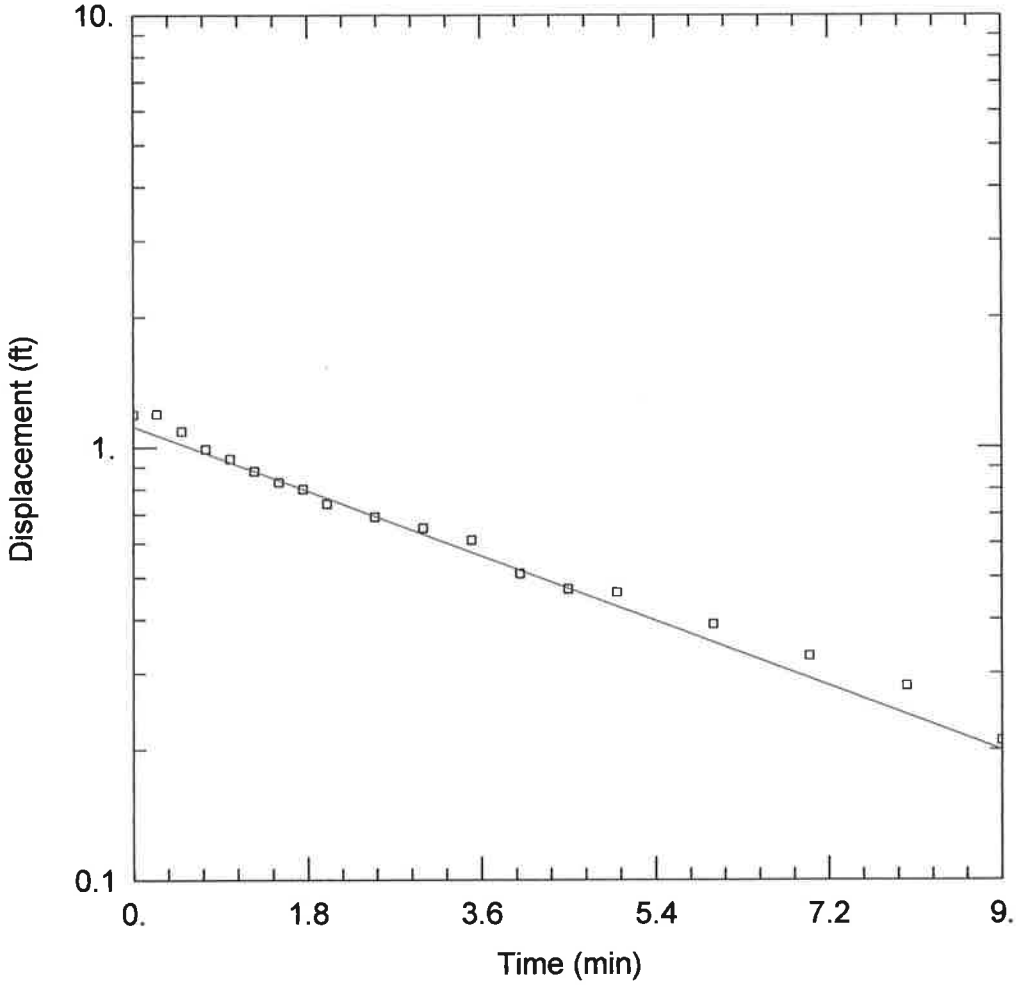
PZM-1 / MW-4
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.19'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 22.70'
Total Depth Well Below Top-of-Casing (BTOC): 25.65'
Static Depth-to-Water BTOC: 11.61'
Static Height of Water in Well: 14.04'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	11.61		
0.25	12.80	11.61	1.19
0.50	12.70	11.61	1.09
0.75	12.60	11.61	0.99
1.00	12.55	11.61	0.94
1.25	12.49	11.61	0.88
1.50	12.44	11.61	0.83
1.75	12.41	11.61	0.80
2.00	12.35	11.61	0.74
2.50	12.30	11.61	0.69
3.00	12.26	11.61	0.65
3.50	12.22	11.61	0.61
4.00	12.12	11.61	0.51
4.50	12.08	11.61	0.47
5.00	12.07	11.61	0.46
6.00	12.00	11.61	0.39
7.00	11.94	11.61	0.33
8.00	11.89	11.61	0.28
9.00	11.82	11.61	0.21

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.PZM-1/MW-4



RISING HEAD SLUG TEST - PZM-1 / MW-4

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\PZM-1.aqt
Date: 09/29/15 Time: 11:49:11

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Moncure Mine
Test Well: PZM-1 / MW-4
Test Date: 9/18/2014

AQUIFER DATA

Saturated Thickness: 14.04 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.19 ft
Total Well Penetration Depth: 22.7 ft
Casing Radius: 0.083 ft
Static Water Column Height: 14.04 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001413 cm/sec
y0 = 1.117 ft

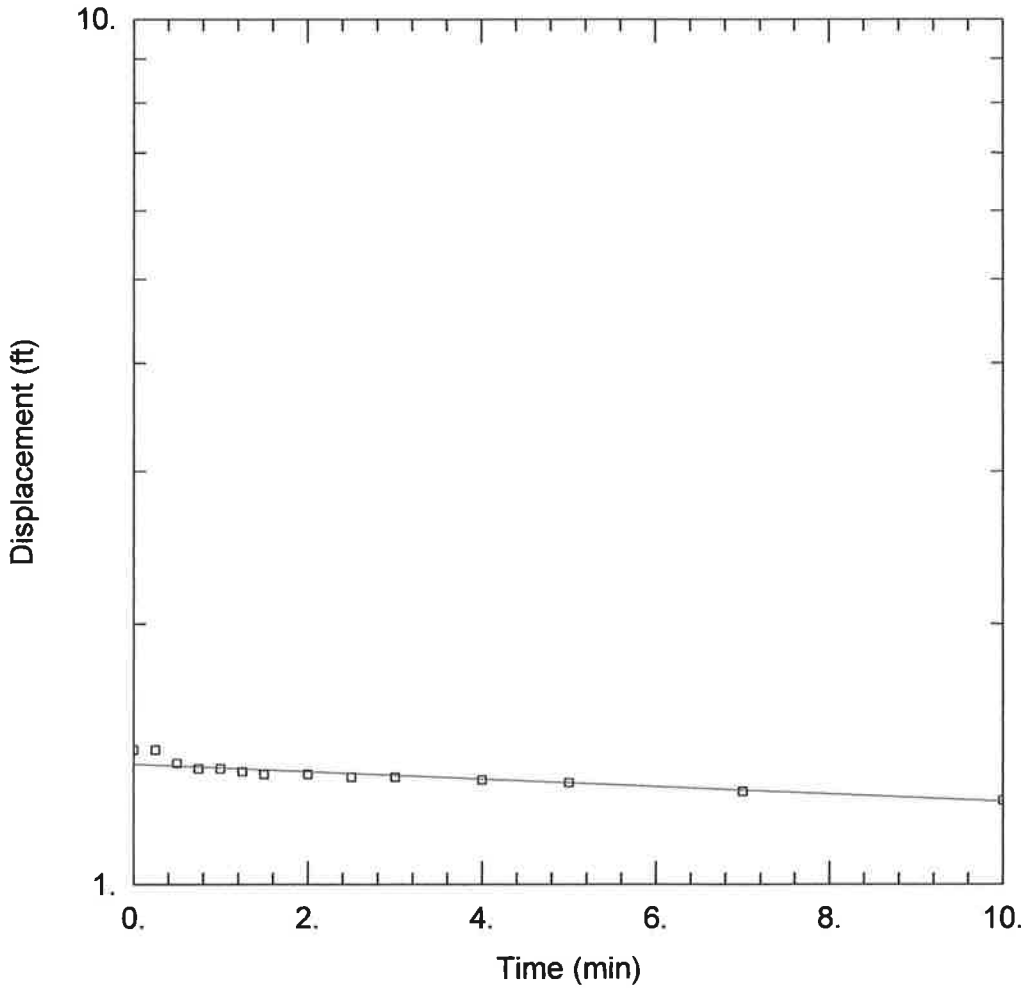
PZM-22 / MW-5
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.43'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 44.40'
Total Depth Well Below Top-of-Casing (BTOC): 46.54'
Static Depth-to-Water BTOC: 14.17'
Static Height of Water in Well: 32.37'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	14.17		
0.25	15.60	14.17	1.43
0.50	15.55	14.17	1.38
0.75	15.53	14.17	1.36
1.00	15.53	14.17	1.36
1.25	15.52	14.17	1.35
1.50	15.51	14.17	1.34
2.00	15.51	14.17	1.34
2.50	15.50	14.17	1.33
3.00	15.50	14.17	1.33
4.00	15.49	14.17	1.32
5.00	15.48	14.17	1.31
7.00	15.45	14.17	1.28
10.00	15.42	14.17	1.25

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-5



RISING HEAD SLUG TEST - PZM-22 / MW-5

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-5.aqt
Date: 09/28/15 Time: 16:23:54

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-5
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 32.37 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.43 ft
Total Well Penetration Depth: 44.4 ft
Casing Radius: 0.083 ft
Static Water Column Height: 32.37 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.01E-6 cm/sec
y0 = 1.376 ft

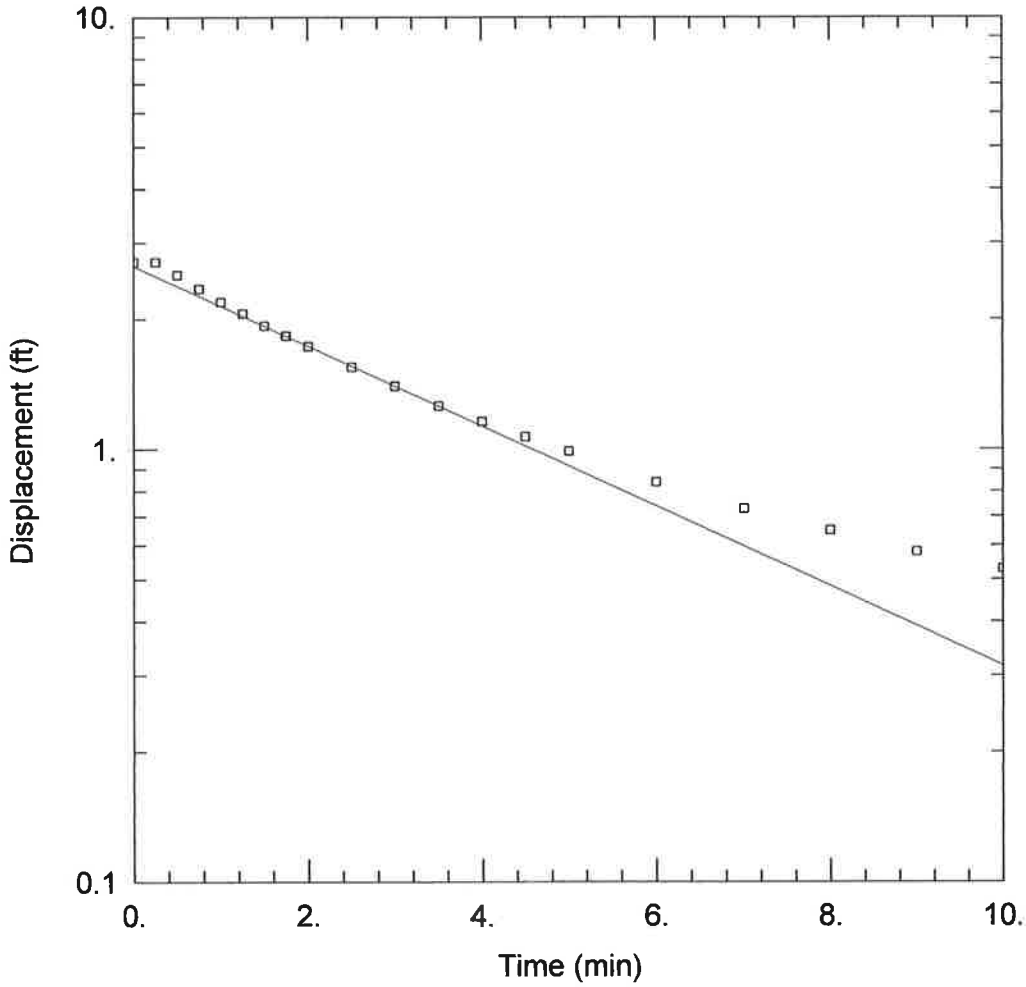
MW-6
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 2.71'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 27.00'
Total Depth Well Below Top-of-Casing (BTOC): 29.47'
Static Depth-to-Water BTOC: 8.25'
Static Height of Water in Well: 21.22'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	8.25		
0.25	10.96	8.25	2.71
0.50	10.78	8.25	2.53
0.75	10.60	8.25	2.35
1.00	10.44	8.25	2.19
1.25	10.31	8.25	2.06
1.50	10.18	8.25	1.93
1.75	10.08	8.25	1.83
2.00	9.98	8.25	1.73
2.50	9.80	8.25	1.55
3.00	9.65	8.25	1.40
3.50	9.51	8.25	1.26
4.00	9.41	8.25	1.16
4.50	9.32	8.25	1.07
5.00	9.24	8.25	0.99
6.00	9.09	8.25	0.84
7.00	8.98	8.25	0.73
8.00	8.90	8.25	0.65
9.00	8.83	8.25	0.58
10.00	8.78	8.25	0.53

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (2) bailers of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-6



RISING HEAD SLUG TEST - MW-6

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-6.aqt
Date: 09/28/15 Time: 16:31:56

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-6
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 21.22 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 2.71 ft
Total Well Penetration Depth: 27. ft
Casing Radius: 0.083 ft
Static Water Column Height: 21.22 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001097 cm/sec
y0 = 2.65 ft

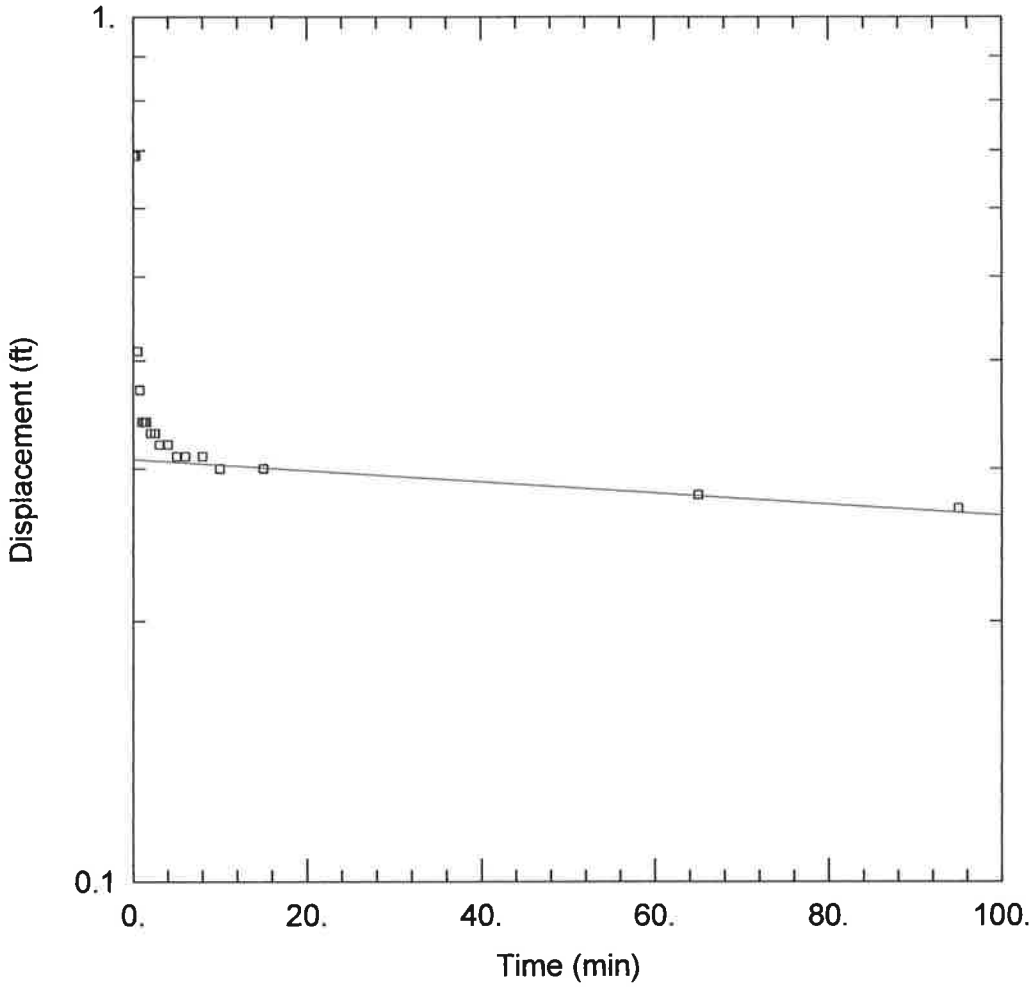
MW-7
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.69'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 15.00'
Total Depth Well Below Top-of-Casing (BTOC): 17.18'
Static Depth-to-Water BTOC: 9.11'
Static Height of Water in Well: 8.07'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	9.11		
0.25	9.80	9.11	0.69
0.50	9.52	9.11	0.41
0.75	9.48	9.11	0.37
1.00	9.45	9.11	0.34
1.25	9.45	9.11	0.34
1.50	9.45	9.11	0.34
2.00	9.44	9.11	0.33
2.50	9.44	9.11	0.33
3.00	9.43	9.11	0.32
4.00	9.43	9.11	0.32
5.00	9.42	9.11	0.31
6.00	9.42	9.11	0.31
8.00	9.42	9.11	0.31
10.00	9.41	9.11	0.30
15.00	9.41	9.11	0.30
65.00	9.39	9.11	0.28
95.00	9.38	9.11	0.27

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-7



RISING HEAD SLUG TEST - MW-7

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-7.aqt
Date: 09/28/15 Time: 16:35:56

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-7
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 8.07 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.69 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 8.07 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.264E-6 cm/sec
y0 = 0.3075 ft

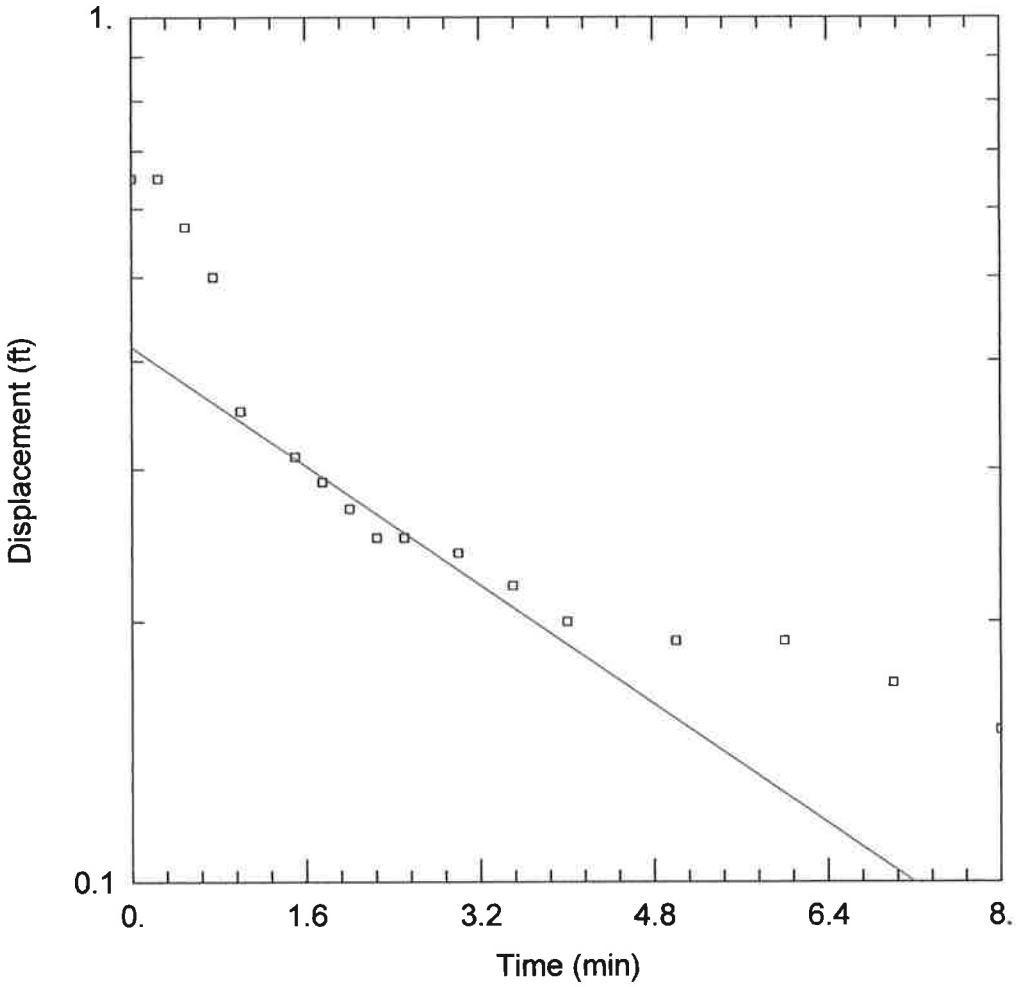
MW-8
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.65'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 46.00'
Total Depth Well Below Top-of-Casing (BTOC): 49.06'
Static Depth-to-Water BTOC: 36.40'
Static Height of Water in Well: 12.66'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	36.40		
0.25	37.05	36.40	0.65
0.50	36.97	36.40	0.57
0.75	36.90	36.40	0.50
1.00	36.75	36.40	0.35
1.50	36.71	36.40	0.31
1.75	36.69	36.40	0.29
2.00	36.67	36.40	0.27
2.25	36.65	36.40	0.25
2.50	36.65	36.40	0.25
3.00	36.64	36.40	0.24
3.50	36.62	36.40	0.22
4.00	36.60	36.40	0.20
5.00	36.59	36.40	0.19
6.00	36.59	36.40	0.19
7.00	36.57	36.40	0.17
8.00	36.55	36.40	0.15

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-8



RISING HEAD SLUG TEST - MW-8

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-8.aqt
Date: 09/28/15 Time: 16:39:34

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-8
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 12.66 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.65 ft
Total Well Penetration Depth: 46. ft
Casing Radius: 0.083 ft
Static Water Column Height: 12.66 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001289 cm/sec
y0 = 0.4152 ft

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C

Appendix C - Well Abandonment Records

Buxton Environmental, Inc.

1101 South Blvd., Suite 101 ~ Charlotte, North Carolina 28203
Phone (704) 344-1450 ~ Fax (704) 344-1451 ~ e-mail: buxtonenv@bellsouth.net

June 26, 2015

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202

Subject: ***Report of Abandonment of Piezometers at Cells 1 and 2***
Brickhaven No. 2 Mine Tract "A" Structural Fill
1315 Moncure-Flatwood Road (new address: 1271 Moncure-Flatwood Road)
Moncure, North Carolina

Dear Mr. Plummer,

Buxton Environmental, Inc. respectfully submits this report documenting the abandonment of piezometers located within and adjacent to the footprint of Cells 1 and 2 at the Brickhaven No. 2 Mine Tract "A" Structural Fill site located at 1315 Moncure-Flatwood Road (new address: 1271 Moncure-Flatwood Road) in Moncure, North Carolina. The piezometers were installed during the Design Hydrogeologic Report investigation conducted at the site by Buxton Environmental, Inc. The abandonment activities were conducted prior to construction of Cells 1 and 2 on behalf of HDR Engineering of the Carolinas, Inc. The piezometer abandonment activities were conducted in accordance with North Carolina Well Construction Standards (15A NCAC 02C .0113) by a North Carolina Registered Driller, and North Carolina Department of Environment and Natural Resources-Solid Waste Section (NCSWS) guidelines.

From May 26 through June 23, 2015, Mr. Steve Poloniewicz (North Carolina Well Contractor Certification # 2284-A) with SAEDACCO, Inc. conducted the abandonment of nine (9) single stand-alone shallow piezometers (PZM-5, PZM-10, PZM-11, PZM-12, PZM-13, PZM-15, PZM-16, PZM-18 and, PZM-29) and four (4) shallow/deep nested piezometer pairs (PZM-2 and PZM-2D, PZM-7s and PZM-7, PZM-14s and PZM-14, and PZM-17s and PZM-17) with oversight by Mr. Ross Klingman, P.G. (North Carolina Geologist License #1266) with Buxton Environmental, Inc. (North Carolina Corporate License #C-278). Prior to the abandonment of the piezometers, the protective steel stand-up well covers and concrete pads were removed. Each shallow piezometer was abandoned by over-drilling by advancing 8-inch outer diameter (4.25-inch inner diameter) hollow-stem augers over the piezometer (to keep boring centered) to the base of the piezometer (with the exception of PZM-5 as explained below), removing the PVC piezometer material, and tremie-grouting the boring from the base of the piezometer to the ground surface with neat cement grout. At PZM-5, auger refusal was encountered before reaching the total 27-foot depth of the piezometer (auger refusal occurred at 12-feet below grade). Each nested piezometer pair was abandoned by over-drilling by first pulling the shallow piezometer, then advancing 8-inch outer diameter (4.25-inch inner diameter) hollow-stem augers over the piezometer (to keep boring centered) to the base of the piezometer, removing the PVC piezometer material, and tremie-grouting the boring from the base of the piezometer to the ground surface with neat cement grout. Removed piezometer materials were properly disposed at an off-site facility by SAEDACCO, Inc. The Well Abandonment Records (Form GW-30) and original boring logs are attached in Appendix A. Reference Figure 3 in the Design Hydrogeologic Report section of the Brickhaven No.2 Mine Tract "A" Structural Fill permit application for abandoned piezometer locations.

If you have any further questions concerning these matters, please give me a call at (704) 344-1450.

Sincerely,
Buxton Environmental, Inc.

Ross Klingman, P.G.

NORTH CAROLINA
LICENSED
SEAL
1266
GEOLOGIST
CHARLES ROSS KLINGMAN

APPENDIX A
WELL ABANDONMENT RECORDS AND BORING LOGS

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-5

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

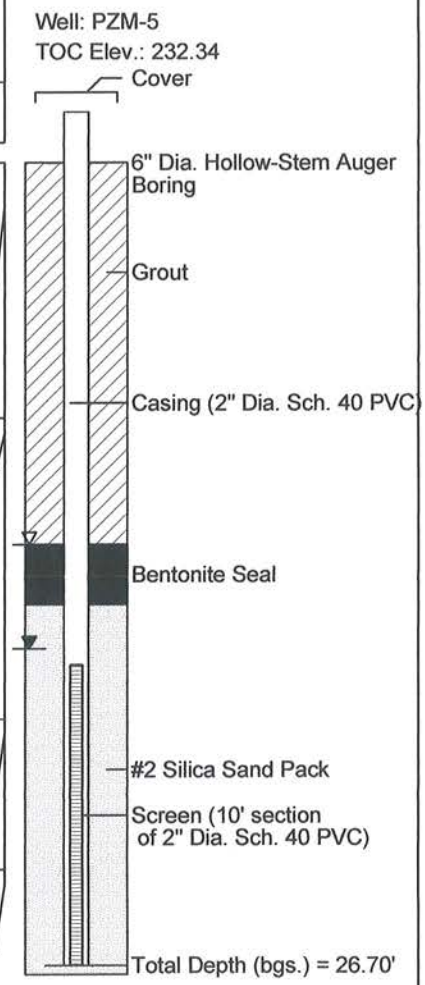
Date Started:	: 8/6/14	Logged By:	: Sean Quarry (HDR)
Date Completed:	: 8/6/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: HPC Land Services	Top-of-Casing Elev.:	: 232.34'(Lawrence Survey)
Drillers Name:	: Jason Cain	Ground Surface Elev.:	: 229.26'(Lawrence Survey)
NC Driller Certification:	: 3112A	Natural, Cut, Fill Grade::	natural

Water Levels
- 1 Hour = 15.95'
- 24 Hours = 12.49'

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	229.26	[illegible]	SS,BAG	18	moist; stiff; reddish brown (5 YR 4/4) with gray; fine sandy silty clay; medium plasticity; cohesive; Residuum; (Lab Results: PZM-5 Bag (0-1.5'); USCS=CL; Gravel=15.7; Sand=21.4%; Silt=48.3%; Clay=14.6%; Effective Porosity=15%; Atterberg Limits: PL=22, LL=35, PI=13)
5	224.26				
		50/1"	SS	4	moist; very hard; reddish brown (5YR 4/4) with gray; fine sandy silty clay; medium plasticity; cohesive; Partially Weathered Rock
10	219.26				
15	214.26				
		50/0.5"	SS	0	soil cuttings; moist; very hard; reddish brown (5YR 4/4); fine sandy silty clay; medium plasticity; cohesive; Partially Weathered Rock
20	209.26				
		50/0.5"	SS	0	soil cuttings; wet; very hard; dark reddish brown (5YR 3/3); fine sandy silty clay' medium plastic; cohesive; Partially Weathered Rock
25	204.26				
30	199.26				
35	194.26				
40	189.26				
45					

Auger Refusal @ 27'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/30/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-5

6b. Total well depth: 28 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 28' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~75 gallons

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade. SEE TEXT For clarification. RK

8. Certification:

Steve Poloniewicz — 6/17/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-10

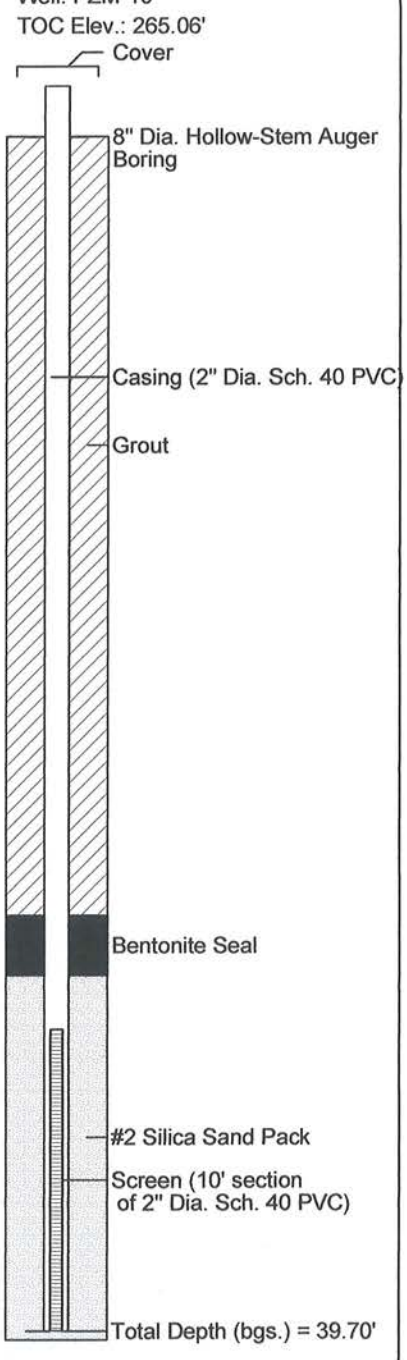
Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 8/12/14	Logged By:	: Sean Quarry (HDR)
Date Completed:	: 8/12/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 265.06'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 262.23'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	262.23	4 4 6	SS	20	moist; stiff; dark reddish brown (5YR 3/4) with gray; silty clay; medium plasticity; cohesive; Residuum
5	257.23	7 11 14	SS	17	moist; very stiff; dark reddish brown (5YR 3/4) with gray; horizontal fissile; sandy silty clay; medium plasticity; cohesive; Residuum
10	252.23	7 9 22	SS	16	moist; very stiff; dark reddish brown (5YR 3/3) with gray, yellow and black; silty sandy clay; medium plasticity; cohesive; Residuum
15	247.23	24 50/5"	SS	13	moist; very hard; reddish brown (5YR 4/3) with gray; horizontal fissle; sandy silty clay; low plasticity; cohesive; Partially Weathered Rock
20	242.23	25 50/5"	SS,BAG	11	moist; very hard; reddish brown (5YR 6/3) with gray; sandy silty clay; low plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-10 Bag (18.5-20'); USCS=CL; Sand=11.9%; Silt=59.1%; Clay=29%; Effective Porosity=4%; Atterberg Limits: PL=19, LL=30, PI=11)
25	237.23	50/5"	SS	5	moist; very hard; dark reddish gray (5YR 4/2); horizontal fissle; silty sandy clay; low plasticity; cohesive; Partially Weathered Rock
30	232.23	50/2"	SS	2	moist; very hard; dark reddish gray (5YR 4/2); silty clay; low plasticity; cohesive; Partially Weathered Rock
35	227.23	43 50/2"	SS	10	moist/wet; very hard; yellowish red (5YR 4/6); silty clay; low plasticity; cohesive; Partially Weathered Rock
40	222.23	50/0.5"	SS	1	wet; very hard; yellowish red (5YR 4/6); silty clay; low plasticity; cohesive; Partially Weathered Rock
45					



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 06/17/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-10

6b. Total well depth: 40 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 40' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~105 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 6/17/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-11

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

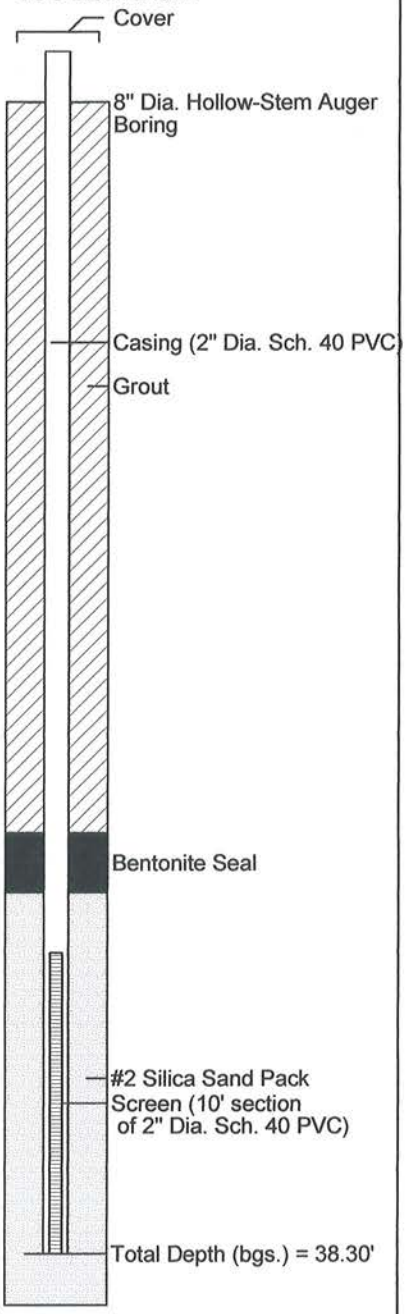
Date Started:	: 8/12/14	Logged By:	: Sean Quarry (HDR)
Date Completed:	: 8/12/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 248.71'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 246.27'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	246.27	8 9 17	SS	17	moist; very stiff; gray (5YR 6/1) with yellow mottles; silty clay; low plasticity; cohesive; Residuum
5	241.27	14 50/3"	SS	10	moist; very hard; gray (5YR 6/2); fine sandy silty clay; low plasticity; cohesive; Partially Weathered Rock
10	236.27	50/3"	SS	3	moist; very hard; grayish green (Gley 1 4/2); weathered sandstone; Partially Weathered Rock
15	231.27	50/6"	SS	6	dry; very hard; grayish green (Gley 1 4/1) with gray; fine sandy silty clay and weathered mudstone; low plasticity; cohesive; Partially Weathered Rock
20	226.27	50/4"	SS	4	dry; redish brown (5YR 4/4); horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
25	221.27	24 50/4"	SS	8	moist; very hard; dark gray (5YR 4/1) with gray and yellow mottles; silty clay with thin weathered mudstone; medium plasticity; cohesive; Partially Weathered Rock
30	216.27	50/3"	SS	4	moist; very hard; reddish brown (5YR 4/3); silty clay with mudstone; low plasticity; cohesive; Partially Weathered Rock
35	211.27	50/1"	SS	1	moist; very hard; reddish brown (5YR 4/3); silty clay with mudstone; low plasticity; cohesive; Partially Weathered Rock
40	206.27	50/3"	SS,BAG	2	moist; very hard; reddish brown (5YR 4/3); silty clay with mudstone; low plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-11 Bag (38.5-40'); USCS=CL; Gravel=4.6%; Sand=12.6%; Silt=62.4%; Clay=20.4%; Effective Porosity=7%; Atterberg Limits: PL=21, LL=37, PI=16)
45					

Well: PZM-11
TOC Elev.: 248.71'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/30/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-11

6b. Total well depth: 38 **(ft.)**

6c. Borehole diameter: 2" **(in.)**

6d. Water level below ground surface: _____ **(ft.)**

6e. Outer casing length (if known): 28' **(ft.)**

6f. Inner casing/tubing length (if known): _____ **(ft.)**

6g. Screen length (if known): 10' **(ft.)**

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ **(gal.)**

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~110 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 05/30/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-12

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

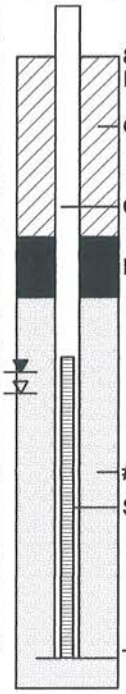
Date Started:	: 8/14/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/14/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 236.07'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 233.21'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = 10.50' bgs
▽ 24 Hours = 11.20' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	233.21	11 12 18	SS,ST	18	dry; very stiff; red (2.5YR 4/6) with black hroizontal planes; silty clay and weathered mudstone; no plasticity; cohesive; Residuum; (Lab Results: PZM-12 UD (0.5-1.5'); USCS=CL; Sand=16.3%; Silt=71.3%; Clay=12.4%; Specific Gravity=2.68; Hydraulic Conductivity=2.36 x 10-6 cm/sec; Total Porosity=19.2%; Effective Porosity=9%; Atterberg Limits: PL=20, LL=31, PI=11)
		22 50/5"	SS	16	
5	228.21				dry; very hard; red (2.5YR 4/6); horizontal to 5 degree fissile; silty clay and weathered mudstone; no plasticity; cohesive; Partially Weathered Rock
		21 50/6"	SS	13	dry; very hard; red (2.5YR 4/6) with light pink horizontal layers; highly horizontal fissile; silty clay and weathered mudstone; ; no plasticity; cohesive; Partially Weathered Rock
10	223.21				
		50/4"	SS	6	dry; very hard; reddish brown (2.5YR 4/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock hard rock layer 16-18.5'
15	218.21				
		32 50/3"	SS	20	wet; hard; reddish brown (2.5YR 4/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
20	213.21				
25	208.21				
30	203.21				
35	198.21				
40	193.21				
45					

Auger Refusal @ 21'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/30/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-12

6b. Total well depth: 20 **(ft.)**

6c. Borehole diameter: 2" **(in.)**

6d. Water level below ground surface: _____ **(ft.)**

6e. Outer casing length (if known): 10' **(ft.)**

6f. Inner casing/tubing length (if known): _____ **(ft.)**

6g. Screen length (if known): 10' **(ft.)**

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ **(gal.)**

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~65 gallons

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 05/30/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-13

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

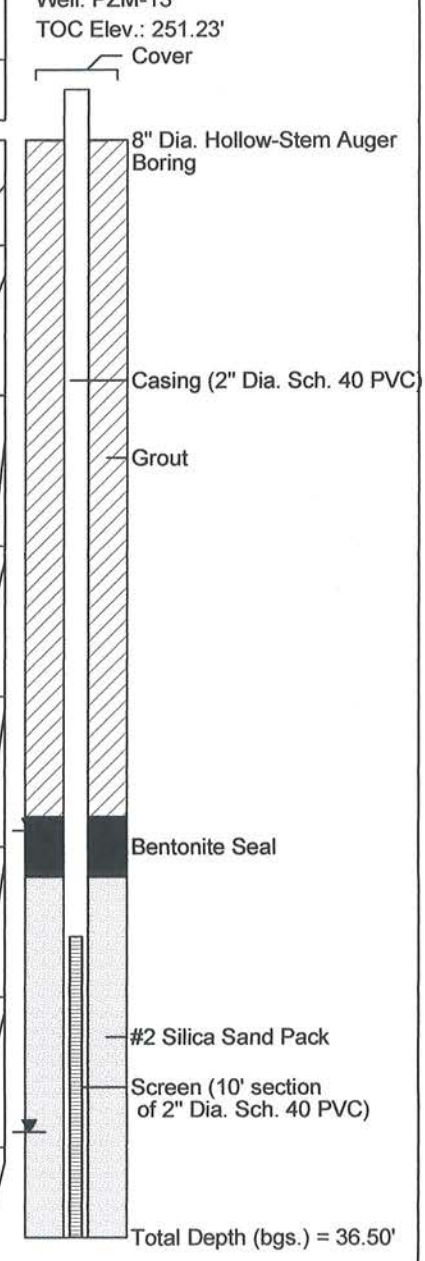
Date Started:	: 8/12/14	Logged By:	: Sean Quarry (HDR)
Date Completed:	: 8/12/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 251.23'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 249.19'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
1 Hour = 33.00' bgs
24 Hours =22.96' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	249.19	3 2 6	SS	19	moist; medium; reddish brown (5YR 5); silty clay; medium plasticity; cohesive; Soil Horizon
5	244.19	22 50/3"	SS	8	moist; very hard; reddish brown (5YR 4/3) with gray and yellow; sandy silty clay; low plasticity; cohesive; Partially Weathered Rock
10	239.19	5 7 14	SS,BAG	16	moist; very stiff; light gray (10YR 7/2) with red brown bands; silty sandy clay; low plasticity; cohesive; Residuum; (Lab Results: PZM-13 Bag (8.5-10'); USCS=CL; Sand=16.4%; Silt=59.8%; Clay=23.8%; Effective Porosity=4%; Atterberg Limits: PL=16, LL=31, PI=15)
15	234.19	50/1"	SS	1	moist; very hard; light gray (10YR 7/2) with red brown; silty sandy clay; low plasticity; cohesive; Partially Weathered Rock
20	229.19	50/6"	SS	5	moist; very harr; dark reddish brown (5YR 4/3) with gray; horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
25	224.19	50/4"	SS	3	dry; very hard; reddish brown (5YR 4/3); silty clay with weathered muddy sandstone; low plasticity; cohesive; Partially Weathered Rock
30	219.19	50/4"	SS	3	dry; very hard; gray; horizontal fissile; silty clay with weathered mudstone; low plasticity; cohesive; Partially Weathered Rock
35	214.19	50/3"	SS	2	dry; very hard; gray; weathered mudstone; Partially Weathered Rock
40	209.19				
45					

Auger Refusal @ 36.5'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 06/18/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-13

6b. Total well depth: 36.5' (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 36.5' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~105 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 6/18/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-15

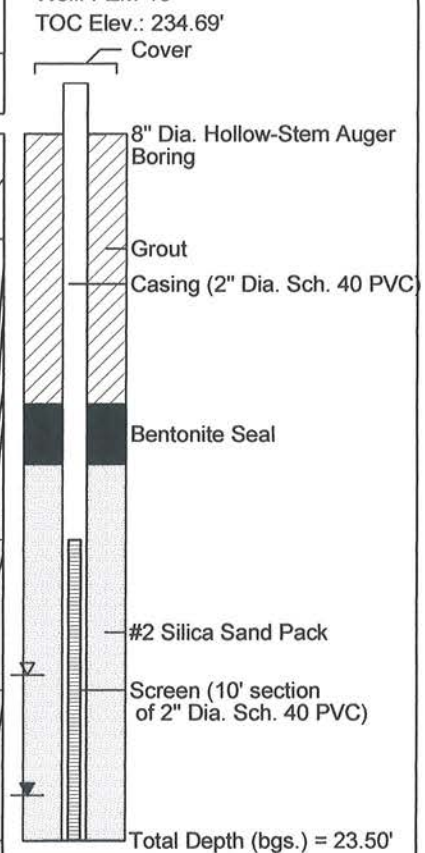
Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 8/13/14	Logged By:	: Sean Quarry (HDR)
Date Completed:	: 8/13/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 234.69'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 231.82'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
- 1 Hour = 22.00' bgs
- 24 Hours = 18.00' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	231.82	2 2 5	SS	13	moist; medium; strong brown (7YR 5/6) with mottles; sandy silty clay with roots; low plasticity; cohesive; Soil Horizon
			ST	10	moist; reddish gray (5YR 5/2); silty clay; low plasticity; cohesive; Residuum; (Lab Results: PZM-15 UD (3.5-4.5'); USCS=CL; Sand=12.1%; Silt=39.6%; Clay=48.3%; Specific Gravity=2.72; Hydraulic Conductivity=3.69 x 10-9 cm/sec; Total Porosity=39.2%; Effective Porosity=1%; Atterberg Limits: PL=19, LL=39, PI=20)
5	226.82	8 11 36	SS	18	
		22 50/3"	SS	11	moist; very hard; reddish gray (5YR 5/2); horizontal fissile; silty clay; low plasticity; cohesive; Residuum
10	221.82				moist; very hard; reddish gray (5YR 5/2); horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
		50/2"	SS	1	moist; very hard; reddish brown (5YR 4/4); fine sandy clayey silt; low plasticity; cohesive; Partially Weathered Rock
15	216.82				
		50/2"	SS	2	moist; very hard; light reddish brown (5YR 6/3); horizontal fissile; fine sandy silt with weathered; low plasticity; cohesive; Partially Weathered Rock
20	211.82				
		50/3"	SS,BAG	3	wet; very hard; very dark gray; silty clay; medium plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-15 Bag (23.5-25'): USCS=CL; Sand=6.3%; Silt=60.7%; Clay=33%; Effective Porosity=3%; Atterberg Limits: PL=17, LL=36, PI=33)
25	206.82				
30	201.82				Auger Refusal @ 23.5'
35	196.82				
40	191.82				
45					



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 06/23/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-15

6b. Total well depth: 23.5 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 23.5' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~75 gallons

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 6/24/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-16

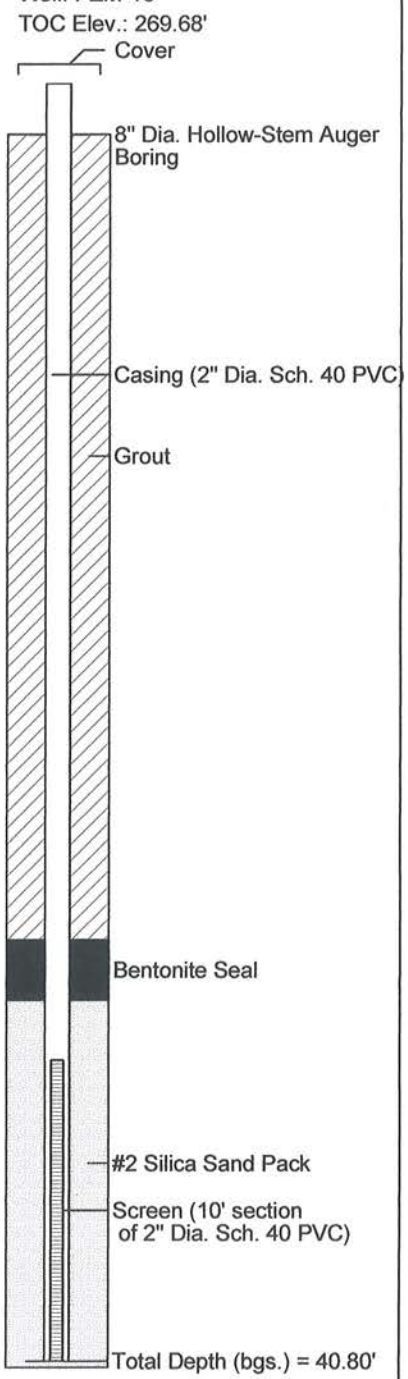
Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 8/14/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/14/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 269.68'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 267.41'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	267.41	3 3 6	SS	1	very moist; stiff; yellowish brown (10YR 6/6); fine to coarse sandy silty clay with quartz cobbles; medium plasticity; cohesive; Soil Horizon
5	262.41	4 5 8	SS	16	moist; stiff; light yellowish brown (2.5YR 6/4) with red orange mottles; clay; high plasticity; cohesive; Soil Horizon
10	257.41	2 3 4	SS	17	moist; medium; light yellowish brown (2.5YR 6/4) with red orange mottles; silty clay; medium plasticity; cohesive; Soil Horizon
			ST	10	moist; light yellowish brown (2.5YR 6/4) with red orange mottles; silty clay; medium plasticity; cohesive; Soil Horizon; (Lab Results: PZM-16 UD (10-11'); USCS=MH; Gravel=0.1%; Sand=7.2%; Silt=51.1%; Clay=47.9%; Specific Gravity=2.70; Hydraulic Conductivity=2.86 x 10-7 cm/sec; Total Porosity=48%; Effective Porosity=1%; Atterberg Limits: PL=32, LL=56, PI=24)
15	252.41	8 10 16	SS	18	moist; very stiff; weak red (10YR 4/3) with ligh gray and yellow stringers; silty clay; medium plasticity; cohesive; Residuum
20	247.41	8 16 27	SS	20	moist; hard; gray (10YR 6/1) with light orange and light maroon mottles and stringers; silty clay; no plasticity; cohesive; Residuum
25	242.41	21 50/6"	SS	14	moist; very hard; gray (10YR 6/1) with light orange and light maroon mottles and stringers; silty clay; no plasticity; cohesive; Partially Weathered Rock
30	237.41	22 50/2"	SS	14	moist; very hard; reddish brown (2.5YR 4/4); wavey horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-16 Bag (28.5-30'): USCS=CL; Sand=21.3%; Silt=61.8%; Clay=16.9%; Effective Porosity=10; Atterberg Limits: PL=17, LL=32, PI=15)
35	232.41	50/6"	SS	10	dry; very hard; pinkish gray (7.5YR 6/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
40	227.41	50/1"	SS	3	dry; very hard; pinkish gray (7.5YR 6/2); highly horizontal fissile; weathered sandy mudstone; Partially Weathered Rock
45					Auger Refusal @ 41'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/29/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-16

6b. Total well depth: 42 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 32' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): 10' (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~115 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 6/17/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-18

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

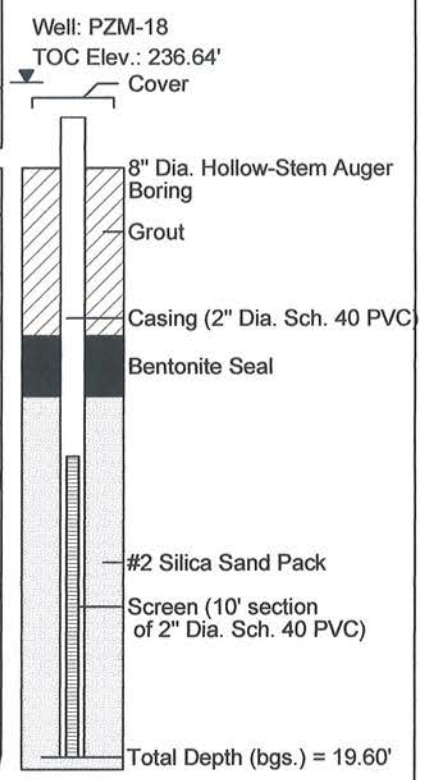
Date Started:	: 8/13/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/13/14	Drilling Method:	: HSA; Geoprobe 8040DT
Drilling Company:	: Geologic Exploration	Top-of-Casing Elev.:	: 236.64'(Lawrence Survey)
Drillers Name:	: Johnny Burr	Ground Surface Elev.:	: 233.78'(Lawrence Survey)
NC Driller Certification:	: 3098A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	233.78	11 12 14	SS	24	dry; very stiff; yellowish red (5YR 4/6) with light gray specks; silty clay with mudstone fragments; no plasticity; cohesive; Residuum
5	228.78	2 8 12	SS	18	dry; very stiff; gray (7.5YR 6/1) with brown and light gray mottles; horizontal fissile; silty clay; no plasticity; cohesive; Residuum
10	223.78	2 4 14	SS,BAG	24	moist; very stiff; grayish brown (10YR 5/2); silty clay with weathered mudstone fragments; no plasticity; cohesive; Residuum; (Lab Results: PZM-18 Bag (8.5-10'); USCS=CL; Sand=7.2%; Silt=56.3%; Clay=36.5%; Effective Porosity=3; PL=20, LL=39; PI=19)
15	218.78	50/2"	SS	8	moist; very hard; dark greenish gray (Gley 2 3/1); weathered sandy mudstone; Partially Weathered Rock
20	213.78	23 50/1"	SS	14	dry; very hard; gray (7.5YR 6/1) with maroon mottles; clayey silt with mudstone fragments; no plasticity; cohesive; Partially Weathered Rock
25	208.78				
30	203.78				
35	198.78				
40	193.78				
45					

Auger Refusal @ 20'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/30/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-18

6b. Total well depth: 20 **(ft.)**

6c. Borehole diameter: 2" **(in.)**

6d. Water level below ground surface: _____ **(ft.)**

6e. Outer casing length (if known): 10' **(ft.)**

6f. Inner casing/tubing length (if known): _____ **(ft.)**

6g. Screen length (if known): 10' **(ft.)**

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ **(gal.)**

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~65 gallons

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 05/30/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-29

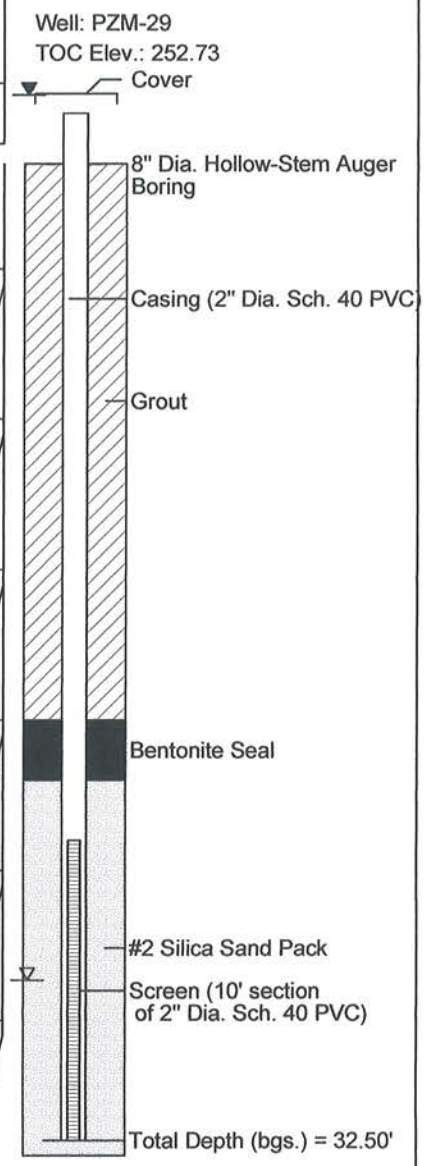
Brickhaven Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 252.73'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 250.44'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	~12' cut

Water Levels
- 1 Hour = dry
- 24 Hours = 27.16' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	250.44				
		50/4"	SS	4	moist; very hard; weak red (10R 4/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
5	245.44				
		50/4"	SS	6	moist; very hard; weak red (10R 4/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
10	240.44				
		50/1"	SS	4	moist; very hard; dark red (10R 3/4); blocky; weathered sandy mudstone; Partially Weathered Rock
15	235.44				
		50/3"	SS	4	moist; very hard; dark red (10R 3/4); highly horizontal fissile; weathered sandy mudstone; Partially Weathered Rock
20	230.44				
		50/4"	SS	3	moist; very hard; dark reddish gray (10R 4/1); highly horizontal fissile; weathered sandy mudstone; Partially Weathered Rock
25	225.44				
		50/3"	SS	6	moist; very hard; weak red (10R 4/2); blocky; weathered sandy mudstone; Partially Weathered Rock
30	220.44				
					Auger Refusal @ 33'
35	215.44				
40	210.44				
45					



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/26/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-29

6b. Total well depth: 32' (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 22' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): 10' (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:752lb ,Wtr:90gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~100 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 05/26/15

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-2 and 2D

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

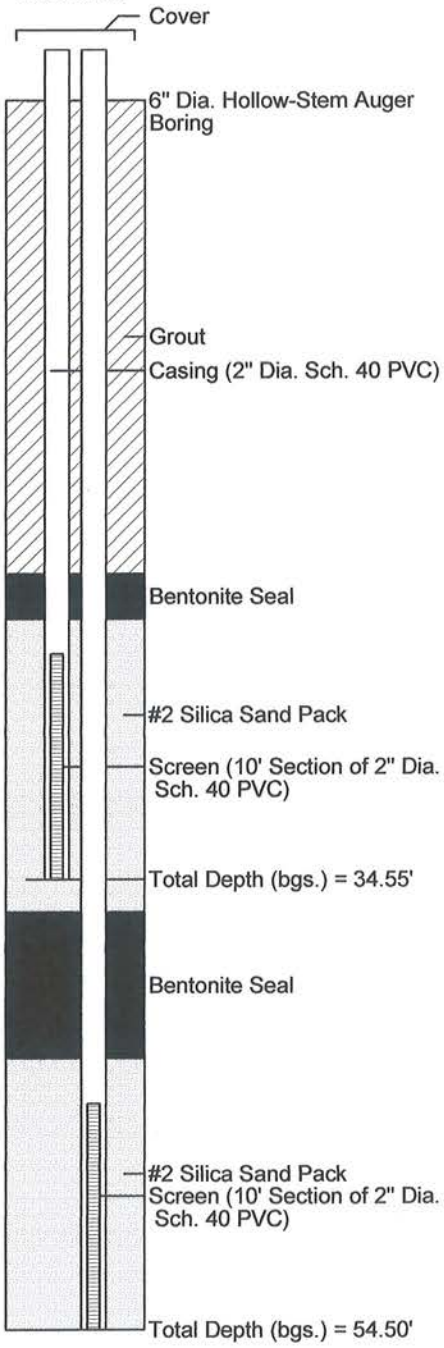
Date Started:	: 8/6/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/6/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: HPC Land Services	Top-of-Casing Elev.:	: 222.37'/222.40'
Drillers Name:	: Jason Cain	Ground Surface Elev.:	: 219.73
NC Driller Certification:	: 3112A	Natural, Cut, Fill Grade::	fill, road bed

Water Levels
- 1 Hour = 32.00' bgs/dry
- 24 Hours = 16.76'/29.49' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	219.73	9 13	SS	10	moist/dry; very stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly clayey silt; no plasticity; cohesive; Fill
5	214.73	4 3 6	SS	8	wet; stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly silty clay with brick fragments; no plasticity; cohesive; Fill
10	209.73	3 5 8	SS	16	moist; stiff; light brownish gray (10YR 6/2) with orange mottles; silty fat clay with roots; high plastcity; cohesive; Soil Horizon
15	204.73	4 11 12	SS	24	moist; very stiff; reddish brown (5YR 4/4) with black mottles; medium horizontal fissile; silty clay; low plasticity; Residuum
20	199.73	50/4"	SS	8	moist; reddish gray (5YR 5/2); highly horizontal fissile; clayey silt; no plasticity; cohesive; Partially Weathered Rock
25	194.73	50/6"	SS,BAG	10	moist; very hard; reddish gray (5YR 5/2) with green flecks; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-2 Bag (23.5-24); USCS=CL; Gravel=4.7%; Sand=19.9%; Silt=50.3%; Clay=25.1%; Effective Porosity=5%; Atterberg Limits: PL=20, LL=38, PI=18)
30	189.73	50/4"	SS	8	moist; very hard; reddish gray (5YR 5/2) with green flecks; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
35	184.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
40	179.73	50/1"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
45	174.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50	169.73	50/3"	SS	8	dry; very hard; dark reddish gray (5/YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
55	164.73	50/3"	SS	4	dry; vary hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
60					

Well1: PZM-2
Well2: PZM-2D
TOC Elev.:



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 06/17/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-2/PZM2B

6b. Total well depth: 54.5 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 54.5 (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 2

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~140 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 6/17/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-7s and 7

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

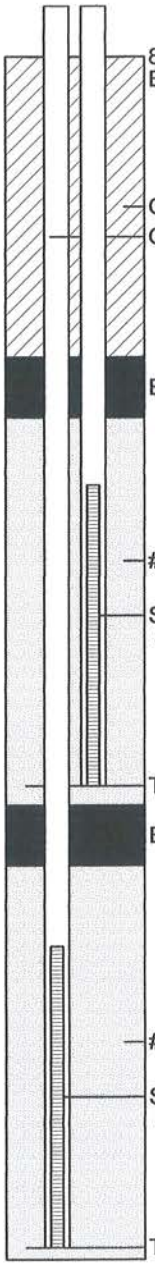
Date Started:	: 8/11/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/11/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 266.04'/265.79'
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 263.59'
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	slight cut

Water Levels
▼ 1 Hour = dry/dry
▽ 24 Hours = dry/dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	263.59	3 5 7	SS	18	moist; stiff; yellowish red (5YR 4/6) with yellow and orange mottles; silty clay; medium plasticity; cohesive; Soil Horizon
5	258.59	5 7 15	SS,ST	24/4	moist; very stiff; weak red (2.5YR 5/2) with light green mottles; silty clay; no plasticity; cohesive; Residuum; (Lab Results: PZM-7 UD (5-5.5'); USCS=CL; Sand=2.2%; Silt=59.5%; Clay=38.3%; Specific Gravity=2.66; Hydraulic Conductivity=4.94 x 10-8 cm/sec; Total Porosity=22.7%; Effective Porosity=2%; Atterberg Limits: PL=22, LL=38; PI=16)
10	253.59	22 50/5"	SS	18	moist; very hard; weak red (10R 5/2) with orange yellow mottles; wavey horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
15	248.59	50/4"	SS	10	moist; very hard; weak red (10R 5/2) with orange yellow mottles; wavey horizontal fissile; weathered mudstone; Partially Weathered Rock
20	243.59	50/4"	SS	10	moist; very hard; weak red (10R 5/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
25	238.59	50/3"	SS	14	moist; very hard; red (2.5YR 4/6) with light green specks; highly horizontal fissile; weathered mudstone and sandstone layers; Partially Weathered Rock
30	233.59	50/3"	SS	6	moist; very hard; dark blueish gray (Glay 2 4/1); horizontal blocky; weathered mudstone; Partially Weathered Rock
35	228.59	50/0"	SS	3	dry; very hard; reddish brown (2.5YR 4/3) with light green specks; blocky; weathered mudstone; Partially Weathered Rock
40	223.59	50/0"	SS	1	wet; very hard; reddish brown (2.5YR 4/3) with light green specks; blocky; weathered mudstone; Partially Weathered Rock
45					Auger Refusal @ 40'

Well1: PZM-2s
Well2: PZM-2
TOC Elev.: Cover



06-26-2015 C:\Users\Ross\Desktop\Boring Logs\PZM-7s-7.bor

WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/26/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-7s/ PZM-7

6b. Total well depth: 39 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 29' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): 10' (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 2

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~110 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 5/26/15

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-14s and 14

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

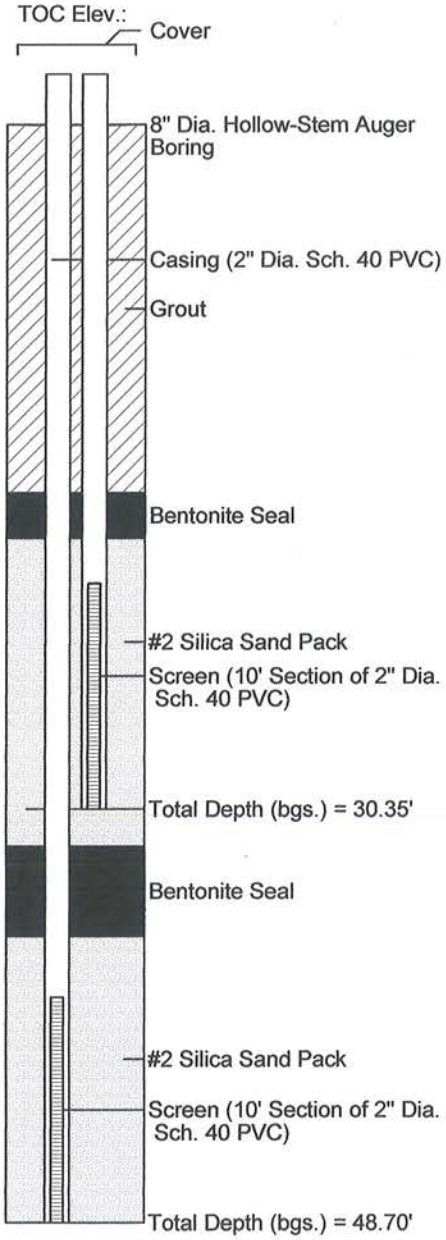
Date Started:	: 8/13/14	Logged By:	: Sean Quarry (HDR)
Date Completed:	: 8/13/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 277.90'/277.75'
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 274.79'
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
- 1 Hour = dry/dry
- 24 Hours = dry/dry

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	274.79	3 3 5	SS	6	moist; medium; light reddish brown (5YR 6/4); sandy silty clay with rocks, gravel and roots; low plastiticy, cohesive; Soil Horizon
5	269.79	5 5 10	SS	18	moist; very stiff; yellowish red (5YR 4/6) with yellow and gray mottles; silty sandy clay; low plasticity; cohesive; Soil Horizon
10	264.79	10 14 19	SS	17	moist; hard; dark gray with red brown; silty clay; medium plasticity; cohesive; Residuum
15	259.79	13 25 50/6"	SS	17	moist; very hard; dark reddish brown (5YR 3/4) with gray; sandy silty clay; medium plasticity; cohesive; Residuum
20	254.79	8 20 50/6"	SS	15	moist; very hard; dark reddish brown (5YR 3/4) with gray; silty clay; medium plasticity; cohesive; Residuum
25	249.79	39 50/2"	SS	10	moist; very hard; reddish brown (5YR 4/3); horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
30	244.79	50/2"	SS	6	moist; very hard; reddish brown (5YR 4/3) with yellow mottles; horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
35	239.79	50/3"	SS	3	moist; very hard; reddish brown (5YR 4/3) with yellow mottles; horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
40	234.79	35 50/2"	SS	7	moist; very hard; reddish brown (5YR 4/4) with gray; horizontal fissile; silty clay; low plasticity; cohesive; Partially Weathered Rock
45	229.79	50/4"	SS	3	wet; very hard; reddish brown (5YR 4/4) with gray; horizontal fissile; low plasticity; cohesive; Partially Weathered Rock
50	224.79	50/6"	SS,BAG	5	wet; very hard, reddish brown (5YR 4/4) with gray and olive; horizontal fissile; silty clay; low plastcity; cohesive; Partially Weathered Rock; (Lab Results: PZM-14 Bag (48-50'): USCS=CL; Sand=1.3%; Silt=66%; Clay=32.7%; Effective Porosity=3%; Atterberg Limits: PL=19, LL=35, PI=16)
55	219.79				
60					

Well1: PZM-14s
Well2: PZM-14
TOC Elev.:



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 06/18/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-14s/14

6b. Total well depth: 49' (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 49' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 2

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~120 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Signature of Certified Well Contractor or Well Owner — Date 06/18/2015

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-17s and 17

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

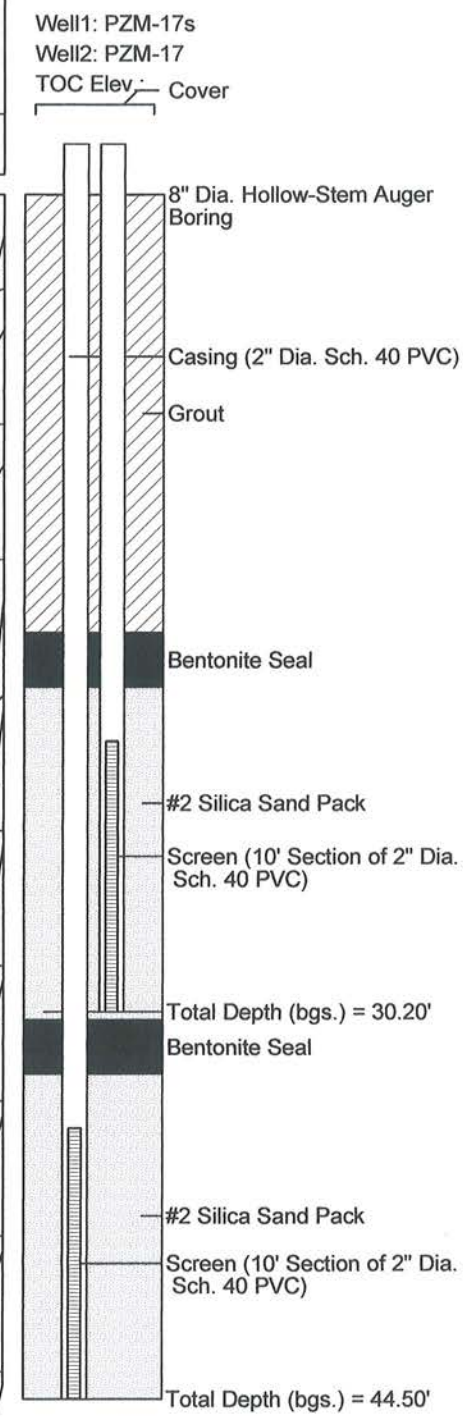
Date Started:	: 8/14/14	Logged By:	: Ross Klingman, P.G
Date Completed:	: 8/14/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 266.74'/266.85'
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 263.78'
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry/dry
▽ 24 Hours = dry/dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	263.78	4 7 10	SS	24	moist; very stiff; dark reddish brown (2.5YR 3/4) with tan and light gray mottles; sandy clay, clayey silt and clayey sand; no plasticity; cohesive; Soil Horizon
5	258.78	8 17 24	SS	18	moist; hard; dark red (2.5YR 3/6) with light green gray mottles; silty clay; no plasticity; cohesive; Residuum
10	253.78	8 11 29	SS	19	moist; hard; dark red (2.5YR 3/6) with light green gray mottles; silty clay; no plasticity; cohesive; Residuum
15	248.78	23 15 17	SS,BAG	14	moist; hard; dark red (2.5YR 3/6) with light green gray mottles; blocky horizontal fissile; silty clay; no plasticity; cohesive; Residuum; (Lab Results PZM-17 Bag (13.5-15'); USCS=CL; Sand 1.5%; Silt=75%; Clay 23.5%; Effective Porosity=4%; Atterberg Limits: PL=19, LL=35, PI=16)
20	243.78	50/3"	SS	10	moist; very hard; dark red (2.5YR 3/6); blocky horizontal fissile; silty clay; no plasticity, cohesive; Partially Weathered Rock
25	238.78	50/4"	SS	6	moist; very hard; dark red (2.5YR 3/6); blocky horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
30	233.78	50/4"	SS	6	moist; very hard; reddish brown (2.5YR 4/4); highly horizontal fissile; weathered sandy mudstone; Partially Weathered Rock
35	228.78	50/1"	SS	3	moist; very hard; dark red (2.5YR 3/6); silty clay with rock fragments; no plasticity; cohesive; Partially Weathered Rock
40	223.78	50/2"	SS	8	dry; very hard; weak red (10R 4/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
45	218.78	50/1"	SS	6	wet; very hard; dark red (2.5YR 3/6); silty clay; no plasticity; cohesive; Partially Weathered Rock
50					

Auger Refusal @ 44.5'



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz

Well Contractor Name (or well owner personally abandoning well on his/her property)

2284-A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: , ,

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 05/29/2015

5a. Well location:

Green Meadows LLC c/o Buxton Environmental

Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure-Flatwood Road Moncure, NC 27559 Chath

Physical Address, City, and Zip

Chatham

County — Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

6a. Well ID#: PZM-17s/ PZM-17

6b. Total well depth: 44.5 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: _____ (ft.)

6e. Outer casing length (if known): 29.5' (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): _____ (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 2

*For multiple injection or non-water supply wells **ONLY** with the same construction/abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Neat cememt Amount:~120 gallon

7g. Provide a brief description of the abandonment procedure:

Overdrill with 8" outer diameter HSA to base of well, remove PVC well, tremmie grout from bottom to grade.

8. Certification:

Steve Poloniewicz — 05/29/2015

Signature of Certified Well Contractor or Well Owner — Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

Buxton Environmental, Inc.

1101 South Blvd., Suite 101 ~ Charlotte, North Carolina 28203
Phone (704) 344-1450 ~ Fax (704) 344-1451 ~ e-mail: buxtonenv@bellsouth.net

October 2, 2015

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202

Subject: ***Report of Abandonment of Piezometer PZM-28***
Brickhaven No. 2 Mine Tract "A" Structural Fill
1271 Moncure-Flatwood Road
Moncure, North Carolina
Permit No.: 1910-STRUCT-2015

Dear Mr. Plummer,

Buxton Environmental, Inc. respectfully submits this report documenting the abandonment of piezometer PZM-28 located outside and adjacent to the fill boundary on the northwest corner of the Brickhaven No. 2 Mine Tract "A" Structural Fill site at 1271 Moncure-Flatwood Road in Moncure, North Carolina. Piezometer PZM-28 was originally planned to be converted into compliance groundwater monitor well MW-8, however, the piezometer remained dry during the investigation. A deeper replacement monitor well MW-8 was installed immediately adjacent to PZM-28 on June 24, 2015. The piezometer was installed during the Design Hydrogeologic Report investigation conducted at the site by Buxton Environmental, Inc. The piezometer abandonment activities were conducted on behalf of HDR Engineering of the Carolinas, Inc. (HDR), and in accordance with North Carolina Well Construction Standards (15A NCAC 02C .0113) and North Carolina Department of Environment and Natural Resources-Solid Waste Section (NCSWS) guidelines.

On September 17, 2015, Mr. Stefan Smith (North Carolina Well Contractor Certification # 3576) with SAEDACCO, Inc. located in Fort Mill, South Carolina conducted the abandonment of piezometer PZM-28. The abandonment activities were conducted with oversight by Mr. Ross Klingman, P.G. (North Carolina Geologist License #1266) with Buxton Environmental, Inc. (North Carolina Corporate License #C-278). Prior to the abandonment of the piezometer, the protective steel stand-up well cover and concrete pad were removed. The piezometer was abandoned by over-drilling by advancing 8-inch outer diameter (4.25-inch inner diameter) hollow-stem augers over the piezometer (to keep boring centered) to the base of the piezometer, removing the PVC piezometer material, and tremie-grouting the boring from the base of the piezometer to the ground surface with neat bentonite/cement grout. Removed piezometer materials were properly disposed at an off-site facility by SAEDACCO, Inc. The Well Abandonment Record (Form GW-30) and original boring log are attached in Appendix A. Reference Figure 3 in the Design Hydrogeologic Report section of the Brickhaven No.2 Mine Tract "A" Structural Fill permit application for the abandoned piezometer location.

A copy of this report should be submitted to the NCSWS within 30 days following the abandonment of PZM-28, which occurred on September 17, 2015, by HDR.

If you have any further questions concerning these matters, please give me a call at (704) 344-1450.

Sincerely,
Buxton Environmental, Inc.

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

Ross Klingman, P.G.
President

APPENDIX A
WELL ABANDONMENT RECORD AND BORING LOG

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-28 (Adjacent to MW-8)

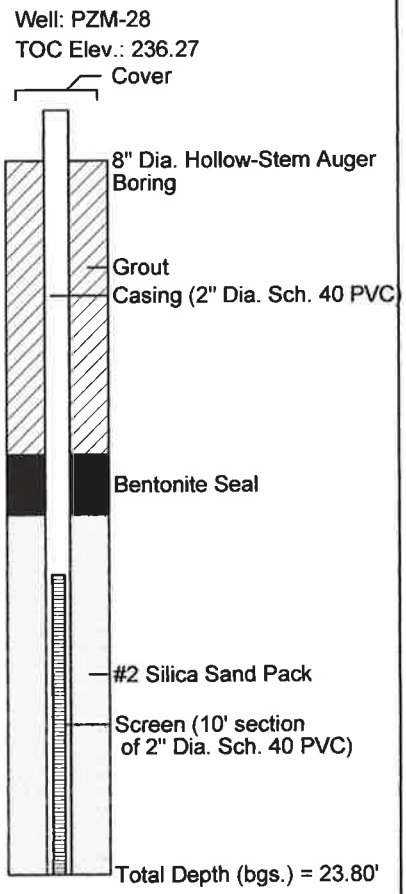
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 236.12'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 234.12'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade:	: natual; 15' S. MW-8

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	234.12	3 4 7	SS	22	moist; stiff; yellowish red (5YR 5/6) with orange mottles; fine sandy silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	229.12	16 17 26	SS	18	moist/dry; very hard; reddish brown (5YR 4/4); clayey silt; no plasticity; cohesive; Residuum
10	224.12	16 50/6"	SS	12	moist; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
15	219.12	50/6"	SS	5	dry; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
20	214.12	50/3"	SS	2	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
25	209.12	50/3"	SS	4	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
30	204.12				
35	199.12				
40	194.12				
45					



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Stefan Smith
Well Contractor Name (or well owner personally abandoning well on his/her property)

3576
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: , ,
List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐ Agricultural	☐ Municipal/Public
☐ Geothermal (Heating/Cooling Supply)	☐ Residential Water Supply (single)
☐ Industrial/Commercial	☐ Residential Water Supply (shared)
☐ Irrigation	
Non-Water Supply Well:	
☒ Monitoring	☐ Recovery
Injection Well:	
☐ Aquifer Recharge	☐ Groundwater Remediation
☐ Aquifer Storage and Recovery	☐ Salinity Barrier
☐ Aquifer Test	☐ Stormwater Drainage
☐ Experimental Technology	☐ Subsidence Control
☐ Geothermal (Closed Loop)	☐ Tracer
☐ Geothermal (Heating/Cooling Return)	☐ Other (explain under 7g)

4. Date well(s) abandoned: 9-17-15

5a. Well location:

Brickhaven
Facility/Owner Name

Facility ID# (if applicable)

1315 Moncure-Flatwood Road
Physical Address, City, and Zip

Chatham
County

Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N -79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

Attach well construction record(s) if available. For multiple injection or non-water supply wells ONLY with the same construction/abandonment, you can submit one form.

6a. Well ID#: PZM-28

6b. Total well depth: 23.80 (ft.)

6c. Borehole diameter: 2 (in.)

6d. Water level below ground surface: NA (ft.)

6e. Outer casing length (if known): 15 (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): 10' (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1
For multiple injection or non-water supply wells ONLY with the same construction/abandonment, you can submit one form.

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: NA

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Bentonite.:2.5lb ,Wtr:gal. Portland-bentonite grout Amour

7g. Provide a brief description of the abandonment procedure:

Overdrill well to depth, tremi grout to surface

8. Certification:

Stefan J Smith
Signature of Certified Well Contractor or Well Owner

9-17-2015
Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

October 5, 2015

Mr. Larry Frost, Environmental Engineer (via electronic mail only)
Permitting Branch, Solid Waste Section
Division of Waste Management, NCDEQ
1646 Mail Service Center
Raleigh NC 27699

Re: Well Abandonment and Updated WQMP
Brickhaven No.2 Mine Tract "A", Permit 1910

Dear Mr. Frost,

On behalf of Green Meadow, LLC and Charah, Inc., HDR provides the following documents for Permit No. 1910 for the Brickhaven No. 2 Mine Site Tract "A" Structural Fill.

The first document is the abandonment record for piezometer PZM-28. This record is being submitted in accordance with Attachment 2, Condition 5 which states "Prior to construction of the phase or cell(s) within the phase, all piezometers, borings and groundwater monitoring wells within the footprint must be properly abandoned in accordance with 15a NCAC 2C .0113(b)(1) and (d). On September 17, 2015 a certified driller from SAEDACCO, Inc. conducted the abandonment with oversight by Mr. Ross Klingman, P.G. with Buxton Environmental. This record is being submitted within 30 days of the completed abandonment in accordance with Attachment 2, Condition 8. A site well location map has also been provided to show the location of all existing and abandoned piezometers as well as monitoring wells.

The second document is a well installation and development report conducted by Mr. Klingman P.G. with Buxton Environmental, Inc. This report covers monitoring wells (MW) 1, 2, 3, 4, 5, 6, 7, 8 and (BG) 1 for the Brickhaven No. 2 Mine site. This report is a follow up to the well construction records submitted by the NC licensed drillers to NCDEQ and to document the well construction and development which will be made a part of the facility operating record as required by permit Attachment 3, Conditions 10 and 25c of the permit. Included in the report is an updated Figure 7, Water Quality Monitoring Plan, identifying the surveyed locations for each monitoring well.

All monitoring wells were sampled for constituents in accordance with permit Attachment 3, Condition 7. Sampling occurred on August 12, 2015; results will be provided in a separate report.

hdrinc.com

440 S Church Street, Suite 1000, Charlotte, NC 28202-2075
704.338.6700

Should you have any questions, comments, or require additional information, please contact me at 704.338.6843.

Sincerely,
HDR Engineering, Inc. of the Carolinas

Michael D. Plummer, PE
Project Manager

cc: Ed Mussler, NCDENR (via electronic mail; one hard copy via UPS)
Elizabeth Werner, NCDENR (via electronic mail)
Norman Divers, Charah (via electronic mail)
Glenn Amey, PG, Charah (via electronic mail)

Enclosures:
Well Abandonment Record, PZM-28
Figure A – Brickhaven Mine No. 2 Site Well Locations
Well Installation and Development Report

Buxton Environmental, Inc.

1101 South Blvd., Suite 101 ~ Charlotte, North Carolina 28203
Phone (704) 344-1450 ~ Fax (704) 344-1451 ~ e-mail: buxtonenv@bellsouth.net

October 2, 2015

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202

Subject: ***Report of Abandonment of Piezometer PZM-28***
Brickhaven No. 2 Mine Tract "A" Structural Fill
1271 Moncure-Flatwood Road
Moncure, North Carolina
Permit No.: 1910-STRUCT-2015

Dear Mr. Plummer,

Buxton Environmental, Inc. respectfully submits this report documenting the abandonment of piezometer PZM-28 located outside and adjacent to the fill boundary on the northwest corner of the Brickhaven No. 2 Mine Tract "A" Structural Fill site at 1271 Moncure-Flatwood Road in Moncure, North Carolina. Piezometer PZM-28 was originally planned to be converted into compliance groundwater monitor well MW-8, however, the piezometer remained dry during the investigation. A deeper replacement monitor well MW-8 was installed immediately adjacent to PZM-28 on June 24, 2015. The piezometer was installed during the Design Hydrogeologic Report investigation conducted at the site by Buxton Environmental, Inc. The piezometer abandonment activities were conducted on behalf of HDR Engineering of the Carolinas, Inc. (HDR), and in accordance with North Carolina Well Construction Standards (15A NCAC 02C .0113) and North Carolina Department of Environment and Natural Resources-Solid Waste Section (NCSWS) guidelines.

On September 17, 2015, Mr. Stefan Smith (North Carolina Well Contractor Certification # 3576) with SAEDACCO, Inc. located in Fort Mill, South Carolina conducted the abandonment of piezometer PZM-28. The abandonment activities were conducted with oversight by Mr. Ross Klingman, P.G. (North Carolina Geologist License #1266) with Buxton Environmental, Inc. (North Carolina Corporate License #C-278). Prior to the abandonment of the piezometer, the protective steel stand-up well cover and concrete pad were removed. The piezometer was abandoned by over-drilling by advancing 8-inch outer diameter (4.25-inch inner diameter) hollow-stem augers over the piezometer (to keep boring centered) to the base of the piezometer, removing the PVC piezometer material, and tremie-grouting the boring from the base of the piezometer to the ground surface with neat bentonite/cement grout. Removed piezometer materials were properly disposed at an off-site facility by SAEDACCO, Inc. The Well Abandonment Record (Form GW-30) and original boring log are attached in Appendix A. Reference Figure 3 in the Design Hydrogeologic Report section of the Brickhaven No.2 Mine Tract "A" Structural Fill permit application for the abandoned piezometer location.

A copy of this report should be submitted to the NCSWS within 30 days following the abandonment of PZM-28, which occurred on September 17, 2015, by HDR.

If you have any further questions concerning these matters, please give me a call at (704) 344-1450.

Sincerely,
Buxton Environmental, Inc.

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

Ross Klingman, P.G.
President

APPENDIX A
WELL ABANDONMENT RECORD AND BORING LOG

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-28 (Adjacent to MW-8)

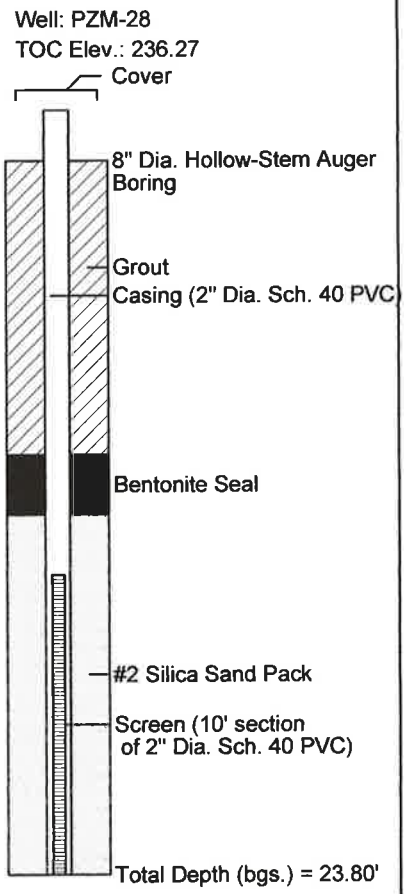
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 236.12'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 234.12'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade:	: natual; 15' S. MW-8

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	234.12	3 4 7	SS	22	moist; stiff; yellowish red (5YR 5/6) with orange mottles; fine sandy silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	229.12	16 17 26	SS	18	moist/dry; very hard; reddish brown (5YR 4/4); clayey silt; no plasticity; cohesive; Residuum
10	224.12	16 50/6"	SS	12	moist; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
15	219.12	50/6"	SS	5	dry; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
20	214.12	50/3"	SS	2	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
25	209.12	50/3"	SS	4	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
30	204.12				
35	199.12				
40	194.12				
45					



WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Stefan Smith
Well Contractor Name (or well owner personally abandoning well on his/her property)

3576
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: , ,
List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:	
☐ Agricultural	☐ Municipal/Public
☐ Geothermal (Heating/Cooling Supply)	☐ Residential Water Supply (single)
☐ Industrial/Commercial	☐ Residential Water Supply (shared)
☐ Irrigation	
Non-Water Supply Well:	
☒ Monitoring	☐ Recovery
Injection Well:	
☐ Aquifer Recharge	☐ Groundwater Remediation
☐ Aquifer Storage and Recovery	☐ Salinity Barrier
☐ Aquifer Test	☐ Stormwater Drainage
☐ Experimental Technology	☐ Subsidence Control
☐ Geothermal (Closed Loop)	☐ Tracer
☐ Geothermal (Heating/Cooling Return)	☐ Other (explain under 7g)

4. Date well(s) abandoned: 9-17-15

5a. Well location:

Brickhaven
Facility/Owner Name

Facility ID# (if applicable)

1315 Moncure-Flatwood Road
Physical Address, City, and Zip

Chatham
County

Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N -79.011080 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

Attach well construction record(s) if available. For multiple injection or non-water supply wells ONLY with the same construction/abandonment, you can submit one form.

6a. Well ID#: PZM-28

6b. Total well depth: 23.80 (ft.)

6c. Borehole diameter: 2 (in.)

6d. Water level below ground surface: NA (ft.)

6e. Outer casing length (if known): 15 (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): 10' (ft.)

For Internal Use ONLY:

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1
For multiple injection or non-water supply wells ONLY with the same construction/abandonment, you can submit one form.

7b. Approximate volume of water remaining in well(s): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: NA

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☐ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:94lb ,Wtr:7gal. Sand Cem.:lb ,Wtr:gal.

Bentonite.:2.5lb ,Wtr:gal. Portland-bentonite grout Amour

7g. Provide a brief description of the abandonment procedure:

Overdrill well to depth, tremi grout to surface

8. Certification:

Stefan J Smith
Signature of Certified Well Contractor or Well Owner

9-17-2015
Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

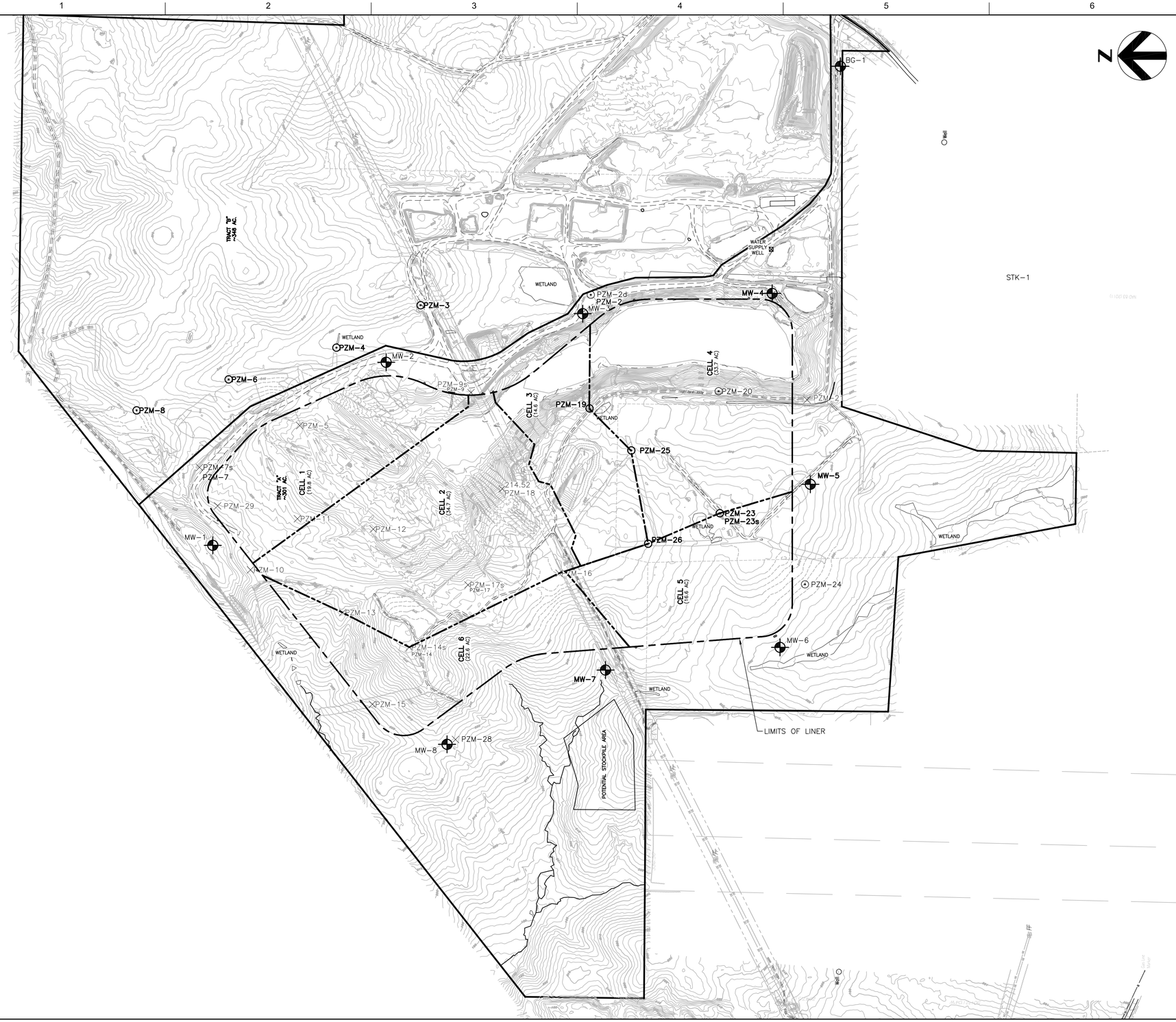
10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.



NOTES:

1. SURVEY BASE MAP PREPARED BY LAWRENCE SURVEYING OF MONROE DATED SEPTEMBER 5, 2014.
2. WELL LOCATIONS SURVEYED BY LAWERENCE SURVEYING OF MONCURE, NC AND McADAMS OF DURHAM, NC.
3. ISSUED FOR INFORMATIONAL PURPOSES ONLY.

LEGEND

MW-3	EXISTING MONITORING WELL
PZM-3	EXISTING PIEZOMETER
PZM-21 X	ABANDONED PIEZOMETER

HDR Engineering Inc.
of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
A	10/5/15	ISSUED FOR INFORMATIONAL PURPOSES

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	
DRAWN BY	J. GAUL
CHECKED BY	
PROJECT NUMBER	453925-237673-018

Charah®

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

BRICKHAVEN MINE NO. 2
SITE WELL LOCATIONS

0 1" 2"

FILENAME 01G-11A.dwg
SCALE 1"=300

SHEET
FIGURE A

C:\pwworking\tpa\d0565687\01G-11A.dwg, Plot, 10/5/2015 11:16:25 AM, jgaul

Buxton Environmental, Inc.
1101 South Blvd., Suite 101 ~ Charlotte, North Carolina 28203
Phone (704) 344-1450 ~ Fax (704) 344-1451 ~ e-mail: buxtonenv@bellsouth.net

October 2, 2015

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202

Subject: ***Compliance Groundwater Monitor Well Installation, Development, Surveying & Hydraulic Conductivity Determination Activities***
Brickhaven No. 2 Mine Tract "A" Structural Fill Site
1271 Moncure-Flatwood Road
Moncure, North Carolina
Permit No.: 1910-STRUCT-2015

Dear Mr. Plummer,

Buxton Environmental, Inc. respectfully submits this report documenting compliance groundwater monitor well installation, development, surveying and hydraulic conductivity determination activities at the Brickhaven No. 2 Mine Tract "A" Structural Fill Site located at 1271 Moncure-Flatwood Road in Moncure, North Carolina. The on-site compliance groundwater monitor well system was installed in general accordance with North Carolina Department of Environment and Natural Resources, Division of Waste Management, Solid Waste Section (NCSWS) 15A NCAC 13B Rules and guidelines; compliance monitor well construction specifications outlined in the *Design Hydrogeologic Report – Addendum, Revision 1* prepared on December 31, 2014 by Buxton Environmental, Inc. for the Brickhaven site; the subsequent *Water Quality Monitoring Plan* prepared by Buxton Environmental, Inc. and submitted to NCSWS as a stand-alone document by HDR Engineering of the Carolinas, Inc. (HDR) on March 23, 2015; the *Permit to Construct/Permit to Operate* (pertaining to Attachment 2-Conditions of Construction-Line Numbers 9, 10, 11 and 12) which was issued for the site by the NCSWS on June 5, 2015; North Carolina Well Construction Standards (15A NCAC 02C .0108); and telephone conversations between the NCSWS and Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. concerning modifications to the approved *Water Quality Monitoring Plan.* Modifications to the *Water Quality Monitoring Plan*, which included the slight adjustment of the approved locations of monitor wells MW-2, MW-3 and MW-6 in order to accommodate on-site features, and the installation of additional background monitor well BG-1 were verbally approved by Ms. Elizabeth Werner with the NCSWS on June 22, 2014 and July 17, 2014, respectively. A groundwater monitoring system map is provided as Figure 7, Water Quality Monitoring Plan, revised.

1.0 BACKGROUND INFORMATION

The original approved *Water Quality Monitoring Plan* stipulated the installation of one (1) upgradient background monitor well (MW-1) and seven (7) downgradient/sidegradient monitor wells (MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8) to be installed at the review boundary outside and adjacent to the structural fill boundary, in order to monitor groundwater quality at the site. Monitor wells MW-4, MW-5, MW-7 and MW-8 were to be converted from piezometers PZM-1, PZM-22, PZM-27 and PZM-28, respectively, which were installed during the Design Hydrogeologic Report assessment. Piezometer PZM-

28 remained dry during the investigation and was unable to be utilized as monitor well MW-8, therefore, it was appropriately abandoned on September 17, 2015. The methods and results of abandonment of PZM-28 will be submitted the NCSWS in a separate report. A deeper replacement MW-8 was required to be installed immediately adjacent to PZM-28, in order to reach the water table, as discussed below.

On June 22, 2015, Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. contacted Ms. Elizabeth Werner with the NCSWS via telephone to request a slight adjustment in the location of monitor wells MW-2, MW-3 and MW-6 (the wells would be moved approximately 20 to 50 feet from the approved locations, but remain between the structural fill boundary and the property boundary), in order to accommodate on-site features. During the conversation, Ms. Werner verbally approved our request to adjust the locations of these wells.

On July 17, 2015, Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. contacted Ms. Elizabeth Werner with the NCSWS via telephone to request the installation of an additional background monitor well (BG-1) to be installed approximately 1,500 feet to the east of the southeast corner of the structural fill boundary, near the guard house and adjacent to Moncure-Flatwood Road. The additional background well would assist with upcoming background (8 independent background events) and future semi-annual groundwater quality monitoring at the site. During the conversation, Ms. Werner verbally approved the installation of the additional background monitor well.

The subject site is located in the Triassic Basin Belt of the Piedmont Physiographic Province, according to the 1985 *North Carolina Geologic Map* prepared by the North Carolina Geological Survey. The Triassic Period is generally recognized to have occurred from approximately 208 to 245 million years ago. The majority of the subject property is located within the Sanford Formation (T_{RCS}) which contains sedimentary rocks consisting of conglomerate, fanglomerate, sandstone and mudstone.

2.0 COMPLIANCE GROUNDWATER MONITOR WELL INSTALLATION ACTIVITIES

Installation of MW-4, MW-5 & MW-7 (converted from piezometers PZM-1, PZM-22 & PZM-27)

From August 13 through December 2, 2014, Mr. Ross Klingman, P.G. (North Carolina Geologist License No.: 1266) with Buxton Environmental, Inc. conducted the oversight of the installation of monitor wells MW-4, MW-5 and MW-7, which were converted from piezometers PZM-1, PZM-22 and PZM-27 installed during the Design Hydrogeologic Report assessment, respectively. Monitor well MW-4 was installed by Mr. Johnny Burr (NC Well Contractor Certification No.: 3098A) with Geologic Exploration, Inc. of Statesville, North Carolina. Monitor wells MW-5 and MW-7 were installed by Mr. Robert Cassell (NC Well Contractor Certification No.: 4143A) with Summit Engineering & Construction Services, Inc. (Summit) of Charlotte, North Carolina. These monitor wells were installed utilizing hollow-stem auger drilling (8-inch outer diameter, 4 1/4-inch inner diameter) with split-spoon standard penetration test (SPT) sampling technology. Split-spoon soil samples were generally collected at each boring at 0-1.5 feet and 3.5-5 feet, then at 5-foot intervals to the terminus of the boring. SPT blow counts were recorded every 6-inches in three increments (18-inch total) over the 24-inch length of the split-spoon sampler. Blow counts for the second and third 6-inch increments are added together to determine Standard Penetration Resistance (N). Drilling equipment was appropriately decontaminated prior to and between use at each well location. The lithology of the each soil sample was logged in the field by Buxton Environmental, Inc. in general accordance with ASTM D 653 standards (included moisture content, Munsell (2000) soil color, density or consistency, grain size, plasticity, cohesion and geologic unit).

The monitor wells were constructed with 10-foot sections of 2-inch diameter, Schedule 40, 0.01-foot mill slotted PVC well screen; an appropriate length of 2-inch diameter, Schedule 40 PVC riser pipe; with a sand pack around the screen; a minimum of 2-feet of hydrated bentonite above the sand pack; and grout (cement and sodium bentonite) above the bentonite seal to the ground surface. The monitor wells were completed at grade with a concrete well pad and lockable steel stand-up cover. The drilling activities were conducted in accordance with North Carolina Well Construction Standards (15A NCAC 02C .0108). Water levels were obtained to the nearest 0.01 foot with a depth-to-water meter approximately 1 hour and 24 hours following installation by Buxton Environmental, Inc. Each well was equipped with a permanently affixed well tag indicating the well contractor name, driller certification number, date of well completion, total depth of well, screen length, depth of sand, bentonite and grout, and well identification number. The boring logs and Well Construction Records (Form GW-1) are provided in Appendix A. A summary of compliance monitor well details is provided in Table 1.

Buxton Environmental, Inc. understands that protective guard post will be installed each monitor well.

Installation of MW-1, MW-2, MW-3, MW-6, MW-8 & BG-1

From June 19 through July 30, 2015, Mr. Ross Klingman, P.G. (North Carolina Geologist License No.: 1266) with Buxton Environmental, Inc. conducted the oversight of the installation of monitor wells MW-1, MW-2, MW-3, MW-6, MW-8 and BG-1. These monitor wells were installed by Mr. Steve Poloiewicz (NC Well Contractor Certification No.: 2284A) with SAEDACCO, Inc. of Fort Mill, South Carolina. These monitor wells were installed utilizing hollow-stem auger drilling (8-inch outer diameter, 4 1/4-inch inner diameter) with split-spoon SPT sampling, or air hammer drilling (5 7/8-inch outer diameter) technology. Hollow-stem auger drilling was generally utilized unless auger refusal was encountered (auger refusal was encountered at MW-1, MW-2 and BG-1), then air hammer drilling was employed to advance the boring to the target depth. However, if the well was located immediately adjacent to a piezometer installed with hollow-stem auger drilling and SPT sampling during the Design Hydrogeologic Report assessment, then air hammer drilling was utilized from the ground surface to the terminus of the boring (MW-3 and MW-8), as sufficient lithologic information had previously been obtained (boring logs for PZM-2/2D (MW-3) and PZM-28 (MW-8) are provided in Appendix A). Split-spoon soil samples were generally collected at each boring from 4 to 5.5 feet, then at 5-foot intervals to the terminus of the boring unless auger refusal was encountered. SPT blow counts were recorded every 6-inches in three increments (18-inch total) over the 24-inch length of the split-spoon sampler. Blow counts for the second and third 6-inch increments are added together to determine Standard Penetration Resistance (N). Air hammer cuttings were collected at five foot intervals to the target depth. Drilling equipment was appropriately decontaminated prior to use at each well location. The lithology of the each soil sample was logged in the field by Buxton Environmental, Inc. in general accordance with ASTM D 653 standards (included moisture content, Munsell (2000) soil color, density or consistency, grain size, plasticity, cohesion and geologic unit).

The monitor wells were constructed with 15-foot sections of 2-inch diameter, Schedule 40, 0.01-foot mill slotted PVC well screen; an appropriate length of 2-inch diameter, Schedule 40 PVC riser pipe; with a sand pack around the screen; a minimum of 2-feet of hydrated bentonite above the sand pack; and grout (cement and sodium bentonite) above the bentonite seal to the ground surface. The monitor wells were completed at grade with a concrete well pad and lockable steel stand-up cover. The drilling activities were conducted in accordance with NCDENR Well Construction Standards (15A NCAC 02C .0108). Water levels were obtained to the nearest 0.01 foot with a depth-to-water meter approximately 1 hour and 24 hours following installation by Buxton Environmental, Inc. Each well was equipped with a permanently affixed well tag indicating the well contractor name, driller certification number, date of well completion, total depth of well,

screen length, depth of sand, bentonite and grout and well identification number. The boring logs and Well Construction Records (Form GW-1) are provided in Appendix A. A summary of compliance monitor well details is provided in Table 1.

Buxton Environmental, Inc. understands that protective guard post will be installed each monitor well.

3.0 DEVELOPMENT OF MONITOR WELLS

During the *Design Hydrogeologic Report* assessment, initial development of monitor wells MW-4 and MW-5 was conducted by Buxton Environmental, Inc. These wells were developed by raising and lowering a submersible pump equipped with polyethylene tubing across the wet portion of the well in order to break-up and remove sediments from the well. The development was conducted until the well went dry. Approximately 10 gallons of water were removed from MW-4 and approximately 14 gallons of water were removed from MW-5 during this development. The pump and tubing were appropriately decontaminated prior to and between use at each well. Development water was discharged on the ground surface at the well head. Monitor well MW-7 was not developed during this initial event, as the well was still dry due to slow recharge conditions.

On July 6, 2015, Buxton Environmental, Inc. conducted the development of monitor wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8. These wells were developed by raising and lowering a submersible pump equipped with polyethylene tubing across the wet portion of the well in order to break-up and remove sediments from the well. The development was conducted until the well went dry. Approximately 5-gallons of municipal tap water obtained from a Charlotte-Mecklenburg Utility Department source was introduced to monitor wells MW-2, MW-3 and MW-7, in order to enhance development of these slow recharging wells. The approximate volume of water removed from the wells during development included: 30 gallons at MW-1; 8 gallons at MW-2; 8 gallons at MW-3; 10 gallons at MW-4; 14 gallons at MW-5; 8 gallons at MW-6; 8 gallons at MW-7; and 12 gallons at MW-8. The pump and tubing were appropriately decontaminated prior to and between use at each well. Development water was discharged on the ground surface at the well head.

SAEDACCO, Inc. developed monitor well BG-1 following installation on July 30, 2015. The well was developed by raising and lowering a submersible pump equipped with polyethylene tubing across the wet portion of the well in order to break-up and remove sediments from the well. The development was conducted until the well went dry. Approximately 30 gallons of water were removed from BG-1 during development. The pump and tubing were appropriately decontaminated prior to use. Development water was discharged on the ground surface at the well head.

On September 10, 2015, Buxton Environmental, Inc. conducted additional development of monitor wells MW-2, MW-3, MW-6, and MW-7. These wells were developed with disposable PVC bailers attached to new nylon rope until the wells went dry. The approximate volume of water removed from the wells during development included: 2.5 gallons at MW-2; 10 gallons at MW-3; 20 gallons at MW-6; and 6 gallons at MW-7. Development water was discharged on the ground surface at the well head.

4.0 SURVEY OF MONITOR WELLS

The ground surface (well pad) and top-of-PVC well casing elevations (to the nearest 0.01 foot), and the horizontal locations of monitor wells MW-4, MW-5 and MW-7 were determined during the Design Hydrogeologic Report assessment by Lawrence Surveying of Monroe, North Carolina.

The ground surface (well pad) and top-of-PVC well casing elevations (to the nearest 0.01 foot), and the horizontal locations of monitor wells MW-1, MW-2, MW-3, MW-6, MW-8 and BG-1 were determined by McAdams surveying of Durham, North Carolina. The monitor well survey data from McAdams is provided in Appendix B.

A summary of the monitor well survey information is provided in Table 1.

5.0 HYDRAULIC CONDUCTIVITY DETERMINATION

On September 10, 2015, Buxton Environmental, Inc. conducted rising head slug tests at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8, in order to determine hydraulic conductivity. Hydraulic conductivity data will be utilized to determine groundwater flow velocity at each monitor well during future groundwater monitoring reports.

Prior to conducting the slug tests, static water levels were obtained at each well to the nearest 0.01 foot with a depth-to-water meter. The slug tests were conducted by lowering one or two disposable PVC bailer (s) attached to new nylon rope below the water level at each well. Water levels were allowed to equilibrate to near static conditions. A slug of water was then removed from the well by withdrawing the bailer(s) and water levels were measured with time.

The slug and recovery test data was evaluated utilizing AQTESOLV software developed by Hydrosolve, Inc. (2007) and in accordance with the methods developed by Bouwer and Rice in 1976 and 1987 (update). The Bouwer-Rice method utilized to evaluate the slug test data was developed to determine the hydraulic conductivity of the aquifer immediately surrounding the screened portion of partially or fully penetrating wells in unconfined aquifers. The rising head slug test data, and corresponding hydraulic conductivity results are provided in Appendix C. A summary of compliance monitor well details and hydraulic conductivities is presented in Table 1.

A copy of this report should be submitted to the NCSWS by HDR for their records.

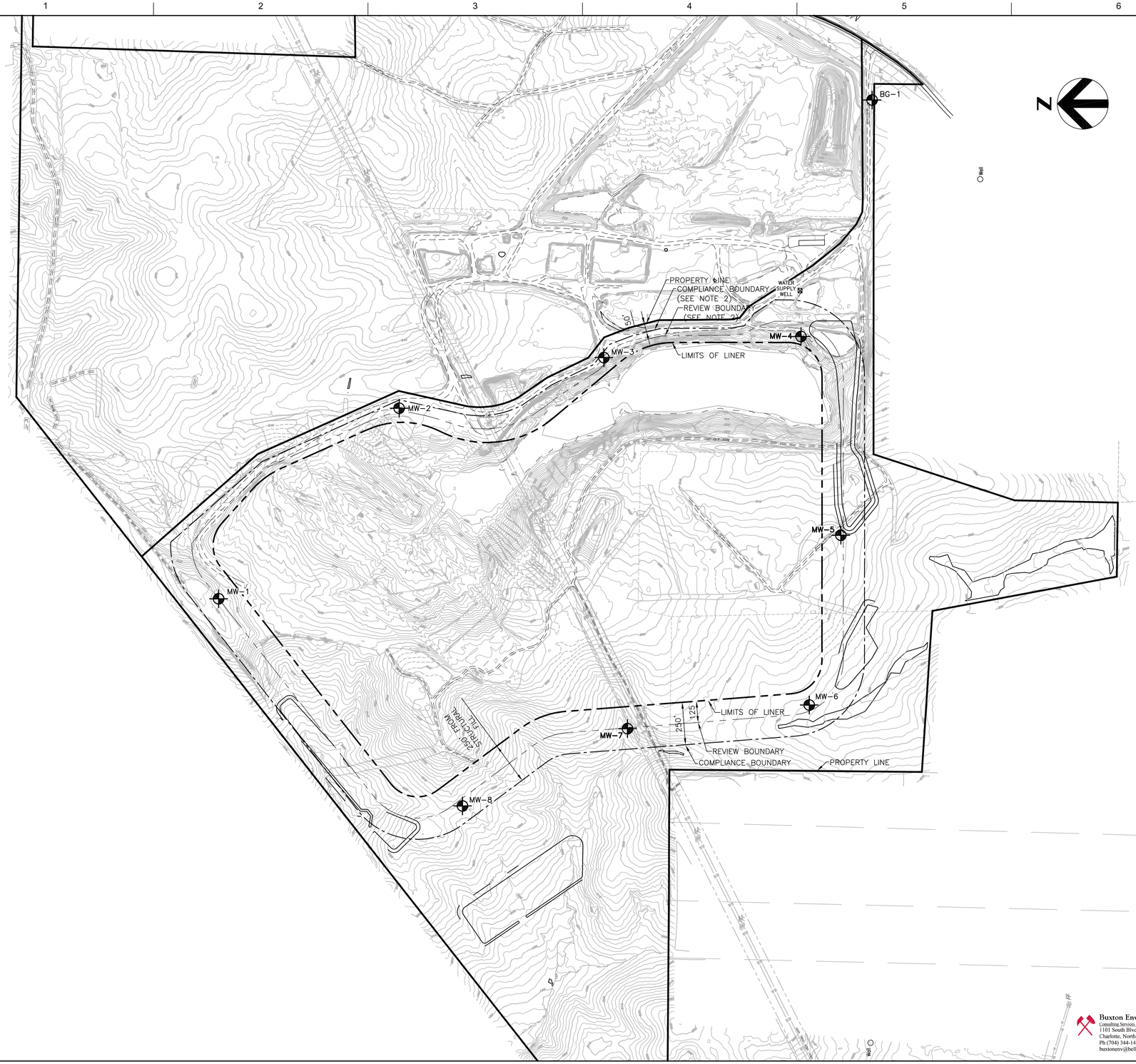
If you have any further questions concerning these matters, please give me a call at (704) 344-1450.

Sincerely,
Buxton Environmental, Inc.

Ross Klingman, P.G.
President

NORTH CAROLINA
LICENSED
SEAL
1266
10-7-15
GEOLOGIST
CHARLES ROSS KLINGMAN

FIGURES



NOTES:

1. SURVEY BASE MAP PREPARED BY LAWRENCE ASSOCIATES OF MONROE DATED SEPT 5, 2014.
2. IN AREAS WHERE THE STRUCTURAL FILL (I.E. PROPOSED LIMITS OF LINER) IS CLOSER THAN 250 FEET TO THE PROPERTY LINE, THE COMPLIANCE BOUNDARY IS SET AT 50 FEET FROM THE PROPERTY LINE. IN THESE AREAS, THE REVIEW BOUNDARY IS SET AT HALF THE DISTANCE BETWEEN THE STRUCTURAL FILL AND THE COMPLIANCE BOUNDARY.
3. REFER TO FIGURE 1 IN THE DESIGN HYDROGEOLOGIC REPORT FOR THE SURFACE WATER MONITORING LOCATIONS., SW-1 AND SW-2.
4. MONITOR WELL LOCATIONS SURVEYED BY LAWRENCE SURVEYING OF MONCURE, NC AND McADAMS OF DURHAM, NC.

LEGEND

- COMPLIANCE GROUNDWATER MONITORING WELL
- COMPLIANCE BOUNDARY
- REVIEW BOUNDARY
- STRUCTURAL FILL / LINER LIMITS

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

HDR Engineering Inc.
of the Carolinas

440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.6700
N.C.B.E.L.S. License Number F-0116

ISSUE	DATE	DESCRIPTION
C	10/2/15	REVISED TO SHOW BG-1 AND NOTE 4
B	12/31/14	REVISED PER NCDENR COMMENTS
A	11/2014	ISSUED FOR APPROVAL

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. KLINGMAN, P.G.
DRAWN BY	J. GAUL
CHECKED BY	
PROJECT NUMBER	453925-237673-018

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN, PG

Charah®

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

WATER QUALITY MONITORING PLAN

0 1" 2"

FILENAME 01G-14.dwg
SCALE 1"=300

SHEET
FIGURE 7

C:\pwworking\hdr\d0505088\01G-14.dwg, Plot, 10/5/2015 11:01:17 AM, jgaul

TABLES

TABLE 1
COMPLIANCE MONITOR WELL DETAILS AND HYDRAULIC CONDUCTIVITIES
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Well ID	*Northing*	*Easting*	*Pad Elev. (ft)*	*TOC Elev. (ft)*	*TD BGS (ft)*	*TD BTOC (ft)*	*Screen Length (ft)*	*Screen Interval (ft)*	*Lithologic Unit*	*Method for Determining Hydraulic Conductivity*	*Hydraulic Conductivity (cm/sec)*
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	Layered Rock/PWR*	slug test	7.761×10^{-5}
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	Layered Rock/PWR*	slug test	4.105×10^{-4}
MW-2	673677.07	1994537.54	227.45	229.97	45.00	47.52	15	197.45 - 182.45	Layered Rock/PWR*	slug test	3.405×10^{-6}
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	PWR	slug test	4.076×10^{-7}
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	Residuum/PWR	slug test	1.413×10^{-4}
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	PWR	slug test	8.010×10^{-6}
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	216.63 - 201.63	Residuum/PWR	slug test	1.097×10^{-4}
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	Residuum/PWR	slug test	1.264×10^{-6}
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	PWR	slug test	1.289×10^{-4}

Notes:

Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.

Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.

TD=total depth;BGS=below ground surface;TOC=top of casing

Hydraulic conductivity values determined by Buxton Environmental, Inc. on September 10, 2015 by conduting rising head slug tests; and solved utilizing the Bouwer-Rice (unconfined slug test) solution with AQTESOLV for Windows Version 4.50 software by Hydrosolv, Inc. (1996-2007).

* = interpreted lithologic unit based on relative drilling hardness during well installation

APPENDIX A
BORING LOGS AND WELL CONSTRUCTION RECORDS (Form GW-1)

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-1

Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

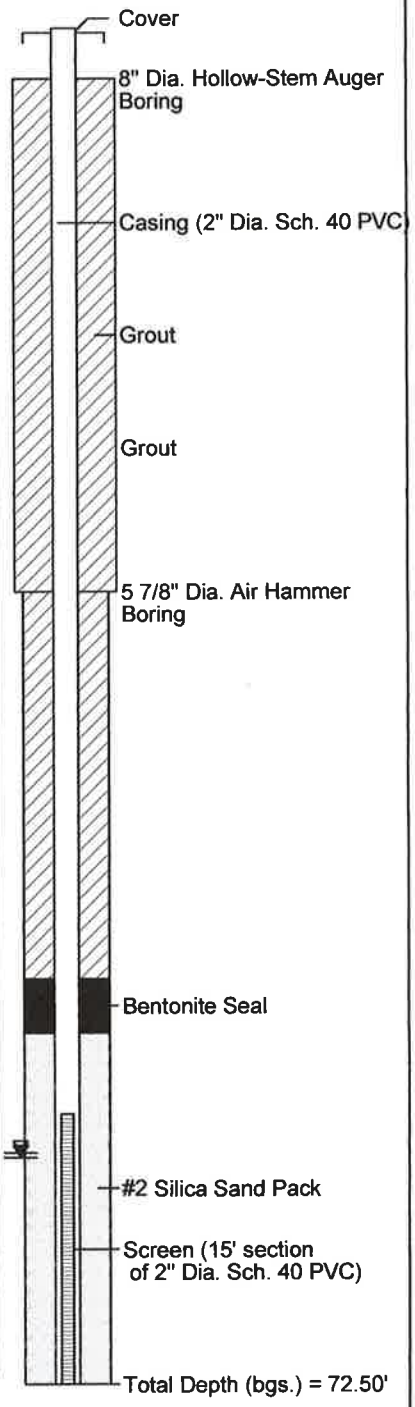
Date Started:	: 6/19/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/22/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 280.08' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 277.28' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	slight cut

Water Levels
- 1 Hour = 59.90' bgs
- 24 Hours = 59.65' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	277.28				
5	272.28	3 5 6	SS	16	moist; stiff; reddish yellow (7.5YR 6/8) with light gray and rust mottles; silty clay with quartz gravel; cohesive; high plasticity; Soil Horizon
10	267.28	6 10 19	SS	16	moist; very stiff; dark reddish brown (2.5YR 3/4) with light tan and gray specks; horizontal fissile; silty clay; cohesive; medium plasticity
15	262.28	5 10 15	SS	14	moist; very stiff; reddish brown (2.5YR 4/4); horizontal blocky fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
20	257.28	9 15 24	SS	15	moist; very stiff; reddish brown (2.5YR 4/4) with rust, light tan and black horizontal bands and mottles; horizontal blocky fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
25	252.28	50/4"	SS	4	dry; very hard; weak red (10R 5/2) with red mottles; horizontal fissile; weathered mudstone; Partially Weathered Rock
		50/2"	SS	3	
30	247.28				dry; very hard; weak red (10R 5/2) with red mottles; horizontal fissile; weathered mudstone; Partially Weathered Rock; Auger Refusal @ 28.5'
35	242.28		cuttings		moist; reddish gray (5YR 5/2); silty fine to coarse sand; hard drilling
40	237.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; medium drilling
45	232.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; hard drilling
50	227.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; hard drilling
55	222.28		cuttings		dry; reddish brown (2.5YR 5/4); silt with fine to coarse mudstone fragments; hard drilling
60	217.28		cuttings		dry; reddish brown (2.5YR 4/4); medium sandy silt; medium drilling
65	212.28		cuttings		dry; pale red (2.5YR 6/2); medium sandy silt; hard drilling
70	207.28		cuttings		wet; reddish brown (2.5YR 5/4); medium sandy silt; very hard drilling
75			cuttings		wet; reddish brown (2.5YR 5/4); medium sandy silt; v. hard drilling

Well: MW-1
TOC Elev.: 280.08'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

For Internal Use ONLY:

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐Agricultural
- ☐Municipal/Public
- ☐Geothermal (Heating/Cooling Supply)
- ☐Residential Water Supply (single)
- ☐Industrial/Commercial
- ☐Residential Water Supply (shared)
- ☐Irrigation

Non-Water Supply Well:

- ☒Monitoring
- ☐Recovery

Injection Well:

- ☐Aquifer Recharge
- ☐Groundwater Remediation
- ☐Aquifer Storage and Recovery
- ☐Salinity Barrier
- ☐Aquifer Test
- ☐Stormwater Drainage
- ☐Experimental Technology
- ☐Subsidence Control
- ☐Geothermal (Closed Loop)
- ☐Tracer
- ☐Geothermal (Heating/Cooling Return)
- ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-1

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒Permanent or ☐Temporary

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 72 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: _____ (in.)

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	57' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
57' ft.	72' ft.	2' in.	.012	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	53' ft.	portland	trimmie
53' ft.	55' ft.	bentonite chips	pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
55' ft.	72' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	24' ft.	tan silty clay
24' ft.	72' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KL NOMAN 9-25-15

21. REMARKS

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor

6/25/2015
Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program, 1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-2

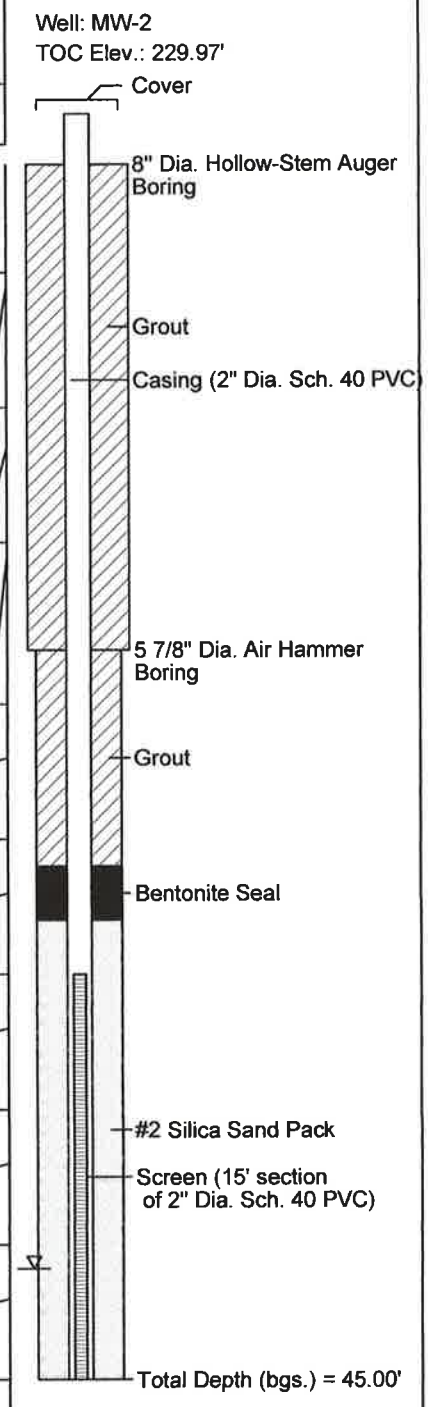
Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 6/22/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/22/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 229.97' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 227.45' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 41.18' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	227.45				
5	222.45	50/5"	SS	6	dry; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Partially Weathered Rock
10	217.45	12 25 30	SS	16	moist; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
15	212.45	50/5"	SS	3	moist; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Partially Weathered Rock; Auger Refusal @ 18'
20	207.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
25	202.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
30	197.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
35	192.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
40	187.45		cuttings		moist; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; medium drilling
45	182.45		cuttings		moist; gray (7.5 6/1); fine to coarse sandy clayey silt with mudstone fragments; medium drilling
50					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-2

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 45 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	30' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
30' ft.	45' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	26' ft.	portland	trimmie
26' ft.	28' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
28' ft.	45' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	16' ft.	tan silty clay
16' ft.	45' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-3

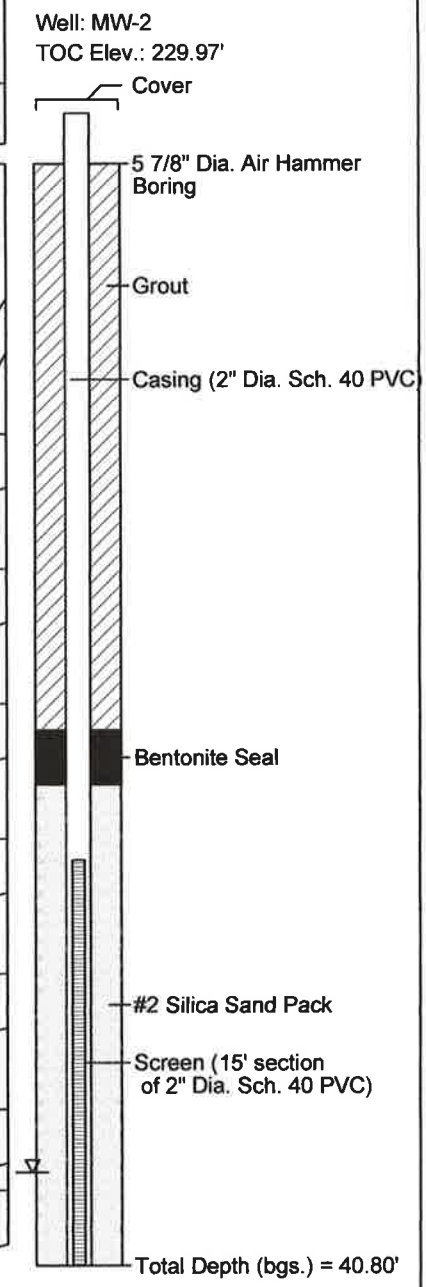
Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 6/23/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/23/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 222.56' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 220.00' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	fill; ~120' NW PZM-2/2D

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 37.10' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	220				See Boring Log PZM-2 and 2D for detailed hollow-stem auger and split spoon sampling data (attached). MW-3 is located ~120' NW of PZM-2 and 2D.
5	215		cuttings		moist; reddish yellow (7.5 YR 6/8); fine sandy clayey silt; soft drilling
10	210		cuttings		dry; brown (7.5YR 5/4); fine to medium sandy clayey silt; soft drilling
15	205		cuttings		dry; brown (7.5YR 5/3); fine to medium sandy clayey silt; soft drilling
20	200		cuttings		dry; brown (7.5YR 5/3); fine to medium sandy clayey silt; soft drilling
25	195		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
30	190		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
35	185		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
			cuttings		dry; pinkish gray (5YR 6/2); fine to medium sandy clayey silt; soft drilling
40	180				
45	175				
50					



Buxton Environmental, Inc.
Consulting Services
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Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-2 and 2D

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

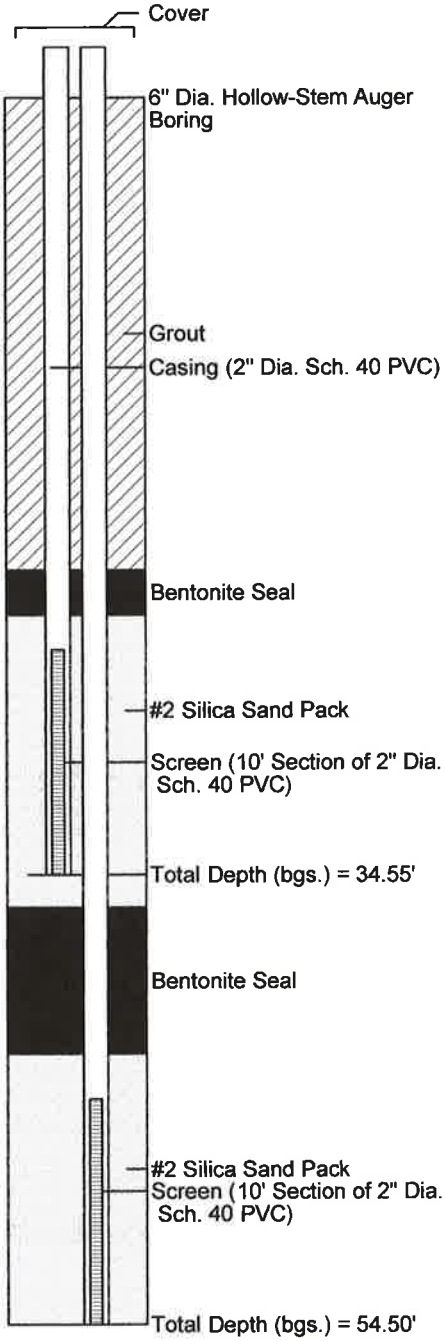
Date Started:	: 8/6/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/6/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: HPC Land Services	Top-of-Casing Elev.:	: 222.37'/222.40'
Drillers Name:	: Jason Cain	Ground Surface Elev.:	: 219.73
NC Driller Certification:	: 3112A	Natural, Cut, Fill Grade::	fill, road bed

Water Levels
- 1 Hour = 32.00' bgs/dry
- 24 Hours = 16.76'/29.49' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	219.73	9 7 13	SS	10	moist/dry; very stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly clayey silt; no plasticity; cohesive; Fill
5	214.73	4 3 6	SS	8	wet; stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly silty clay with brick fragments; no plasticity; cohesive; Fill
10	209.73	3 5 8	SS	16	moist; stiff; light brownish gray (10YR 6/2) with orange mottles; silty fat clay with roots; high plastcity; cohesive; Soil Horizon
15	204.73	4 11 12	SS	24	moist; very stiff; reddish brown (5YR 4/4) with black mottles; medium horizontal fissile; silty clay; low plasticity; Residuum
20	199.73	50/4"	SS	8	moist; reddish gray (5YR 5/2); highly horizontal fissile; clayey silt; no plasticity; cohesive; Partially Weathered Rock
25	194.73	50/6"	SS,BAG	10	moist; very hard; reddish gray (5YR 5/2) with green flecks; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-2 Bag (23.5-24); USCS=CL; Gravel=4.7%; Sand=19.9%; Silt=50.3%; Clay=25.1%; Effective Porosity=5%; Atterberg Limits: PL=20, LL=38, PI=18)
30	189.73	50/4"	SS	8	moist; very hard; reddish gray (5YR 5/2) with green flecks; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
35	184.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
40	179.73	50/1"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
45	174.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50	169.73	50/3"	SS	8	dry; very hard; dark reddish gray (5/YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
55	164.73	50/3"	SS	4	dry; vary hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
60					

Well1: PZM-2
Well2: PZM-2D
TOC Elev.:



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐ Agricultural ☐ Municipal/Public
☐ Geothermal (Heating/Cooling Supply) ☐ Residential Water Supply (single)
☐ Industrial/Commercial ☐ Residential Water Supply (shared)
☐ Irrigation

Non-Water Supply Well:
☒ Monitoring ☐ Recovery

Injection Well:
☐ Aquifer Recharge ☐ Groundwater Remediation
☐ Aquifer Storage and Recovery ☐ Salinity Barrier
☐ Aquifer Test ☐ Stormwater Drainage
☐ Experimental Technology ☐ Subsidence Control
☐ Geothermal (Closed Loop) ☐ Tracer
☐ Geothermal (Heating/Cooling Return) ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-3

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒ **Permanent** or ☐ **Temporary**

7. Is this a repair to an existing well: ☐ **Yes** or ☒ **No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 40 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	25' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
25' ft.	40' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	~~20'~~ 21' ft.	portland	trimmie
21' ft.	23' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
23' ft.	40' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	40' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

21. REMARKS

22. Certification:

Steve Poloniewicz — 6/25/2015
Signature of Certified Well Contractor — Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-1 / MW-4

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

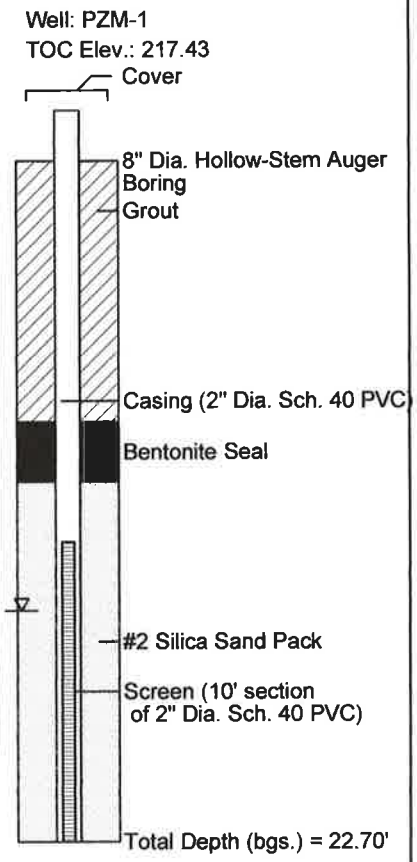
Date Started:	: 8/13/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/13/14	Drilling Method:	: Geoprobe 8049DT
Drilling Company:	: Geologic Exploration	Top-of-Casing Elev.:	: 217.13'(Lawrence Survey)
Drillers Name:	: Johnny Burr	Ground Surface Elev.:	: 214.49'(Lawrence Survey)
NC Driller Certification:	: 3098A	Natural, Cut, Fill Grade:	: Fill (road bed)

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 15.00' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	214.49	4 14 12	SS	14	moist; very stiff; reddish yellow (7.5YR 6/6) with orange, yellow and light gray mottled; fine sandy silty clay with quartz gravel; low plasticity; cohesive; Fill
5	209.49	4 5 6	SS	9	moist; stiff; strong brown (7.5YR 5/6) with light gray and brown mottled; medium sandy silty clay with brick and quartz gravel; medium plasticity; cohesive; Fill
10	204.49	7 5 4	SS,BAG	12	moist; stiff; gray (5YR 6/1) with light orange mottles; very fine sandy coarse silty clay; low plasticity; cohesive; Flood Plain; (Lab Results: PZ-1 Bag (9-10.5'); USCS=CL; Gravel=0.3%; Sand=33.4%; Silt=38.7%; Clay=27.6%; Effective Porosity=5%; Atterberg Limits: PL=18; LL=34, PI=16)
15	199.49	7 10 50/5"	SS,BAG	13	moist/wet; reddish brown (5YR 4/3) with gray mottles; fine sandy silty clay; medium plasticity; cohesive; Residuum; (Lab Results: PZM-1 Bag (14.5-16'); USCS=CL; Gravel=0.1%; Sand=49.6%; Silt=33.1; Clay=17.2%; Effective Porosity=14%; Atterberg Limits: PL=16; LL=24; PI=8)
20	194.49	16 50/2"	SS	6	dry; light gray (5YR 7/1); horizontal fissle weathered mudstone; Partially Weathered Rock
25	189.49				
30	184.49				
35	179.49				
40	174.49				
45					

Auger Refusal @ 22.7'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

JOHNNY BURR

Well Contractor Name

A - 3098

NC Well Contractor Certification Number

GEOLOGIC EXPLORATION, INC

Company Name

2. Well Construction Permit #: _____

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public

☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)

☐Industrial/Commercial ☐Residential Water Supply (shared)

☐Irrigation

Non-Water Supply Well:

☑Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation

☐Aquifer Storage and Recovery ☐Salinity Barrier

☐Aquifer Test ☐Stormwater Drainage

☐Experimental Technology ☐Subsidence Control

☐Geothermal (Closed Loop) ☐Tracer

☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 08/13/14 **Well ID#** PZM-1 / MW-4 CSR

5a. Well Location:

MONCURE MINE

Facility/Owner Name

Facility ID# (if applicable)

1315 MONCURE-FLATWOOD ROAD MONCURE 27559

Physical Address, City, and Zip

CHATHAM

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35° 38' 36.98" N 79° 00' 04.99" W

6. Is (are) the well(s): ☑**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 22.0 (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: 10.0 (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8.0 (in.)

12. Well construction method: AUGER

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	12.0 ft.	2.0 in.	SCH 40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
12.0 ft.	22.0 ft.	2.0 in.	.010	SCH 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0.0 ft.	8.0 ft.	PORTLAND BENTONITE	SLURRY
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
10.0 ft.	22.0 ft.	20-40	FINE SILICA SAND
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	22.0 ft.	BROWN PWR
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

BENTONITE SEAL FROM 8.0 TO 10.0 FEET

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLNOLAN

22. Certification:

Johnny Burr

Signature of Certified Well Contractor

08/18/14

Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-22 / MW-5

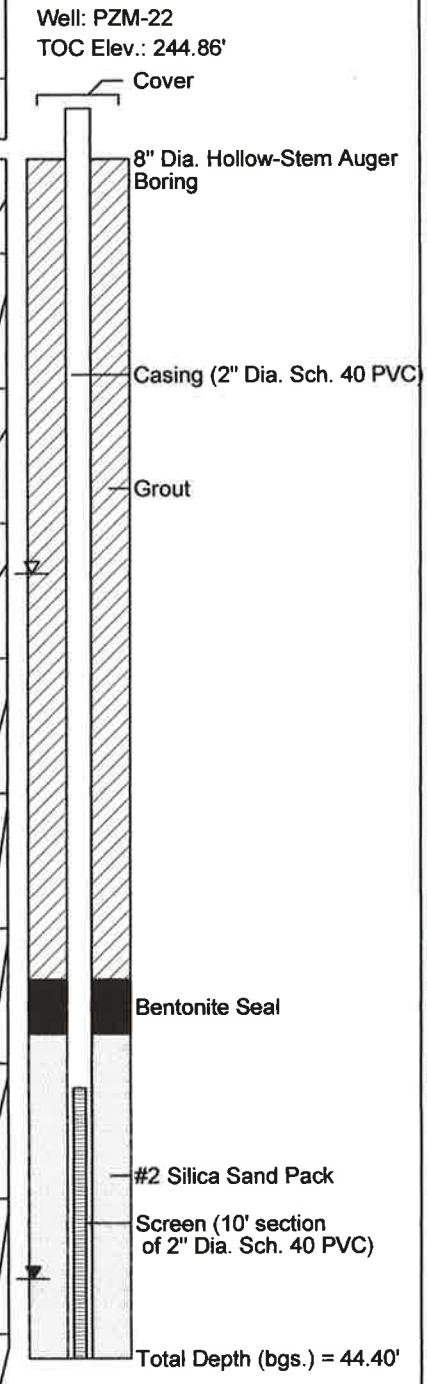
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 11/25/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 11/25/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 244.86'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 242.72'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
1 Hour = 43.60' bgs
24 Hours = 17.50' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	242.72	0 0 3	SS	20	wet; very soft; brownish yellow (10YR 6/8); silty clay with organic matter; high plasticity; cohesive; Soil Horizon
5	237.72	4 4 5	SS	12	very moist; stiff; brownish yellow (10YR 6/8) with rust stringers; silty clay with organic matter; high plasticity; cohesive; Soil Horizon
10	232.72	5 7 8	SS	16	moist; stiff; light gray (5Y 7/1) with light orange and rust specks and mottles; silty clay; medium plasticity; cohesive; Soil Horizon
15	227.72	14 22 34	SS	22	moist; very hard; weak red (10R 4/3) with light green and brown mottles; blocky; silty clay; no plasticity; cohesive; Residuum
20	222.72	14 18 22	SS	23	moist; hard; weak red (10R 4/3) with light green and rust mottles; blocky horizontal fissile; silty clay; no plasticity; cohesive; Residuum
25	217.72	50/6"	SS	12	dry; very hard; reddish brown (5YR 5/3) with light gray mottles; highly horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
30	212.72	50/5"	SS	6	dry; very hard; reddish brown (5YR 5/3) with light gray mottles; wavey horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
35	207.72	50/2"	SS	6	moist; very hard; pinkish gray (7.5YR 6/2); medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
40	202.72	50/5"	SS	6	dry; very hard; light yellowish brown (2.5Y 6/3); medium horizontal fissile; fine to medium sandy silt; no plasticity; cohesive; Partially Weathered Rock
45	197.72	50/5"	SS	4	moist; very hard; dark gray (2.5Y 4/1); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Cassell jr.

Well Contractor Name

4143-A

NC Well Contractor Certification Number

Summit-ECS

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public

☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)

☐Industrial/Commercial ☐Residential Water Supply (shared)

☐Irrigation

Non-Water Supply Well:

☑Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation

☐Aquifer Storage and Recovery ☐Salinity Barrier

☐Aquifer Test ☐Stormwater Drainage

☐Experimental Technology ☐Subsidence Control

☐Geothermal (Closed Loop) ☐Tracer

☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 11/25/14 **Well ID#** pzm-22/mw-5 OTK

5a. Well Location:

Facility/Owner Name _____ Facility ID# (if applicable) _____

1315 Moncure-Flatwood rd.

Physical Address, City, and Zip

Chatham

County _____ Parcel Identification No. (PIN) _____

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 44' (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8.25" (in.)

12. Well construction method: HSA

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
34.0' ft.	+2' ft.	2" in.	.040	pvc
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
44.0' ft.	34.0' ft.	2" in.	.010	.040	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
32.0' ft.	30.0' ft.	bent.	well seal
30.0' ft.	0.0' ft.	port.	trimmie
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
44.0' ft.	32.0' ft.	well sand	trickle down
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1.4 ft.	top soil
1.4 ft.	ft.	
ft.	6.0 ft.	tan fi sa si
6.2 ft.	ft.	brn, reddish tri si
ft.	ft.	
ft.	ft.	
ft.	45.0' ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

22. Certification:

Signature of Certified Well Contractor _____ Date 12-15-14

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:

Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-6

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

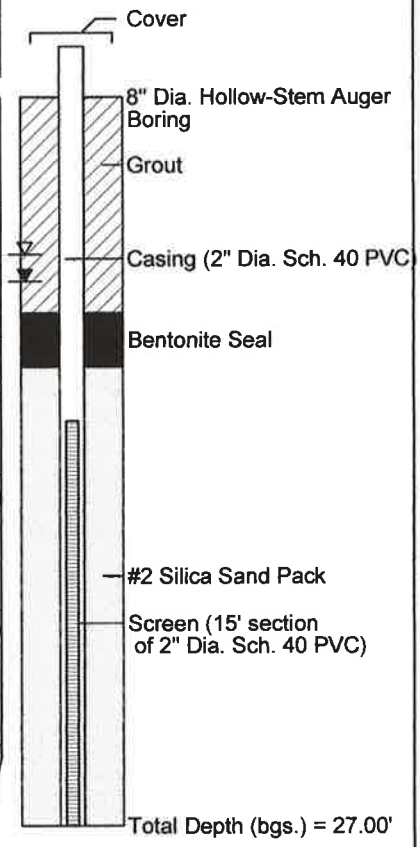
Date Started:	: 6/23/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/23/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 231.10'(McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 228.63'(McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	Natural

Water Levels
- 1 Hour = 6.40' bgs
- 24 Hours = 5.40' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	228.63				
5	223.63	9 20 24	SS	14	moist; hard; reddish brown (2.5YR 4/3); horizontal fissile; weathered mudstone and clayey silt; cohesive; no plasticity; Residuum
10	218.63	11 31 15	SS	16	dry; hard; weak red (10R 5/3) with horizontal orange tan and light green bands; silty clay; cohesive; medium plasticity; Residuum
15	213.63	50/5"	SS	6	moist; very hard; dusky red (2.5YR 3/2) with fine light grat and tan specks; clayey fine to coarse sandy silt; no cohesion or plasticity; Partially Weathered Rock
20	208.63	50/3"	SS	6	dry; very hard; weak red (2.5YR 5/2); weathered mudstone; Partially Weathered Rock
25	203.63	50/3"	SS	5	wet; very hard; weak red (2.5YR 5/2); weathered mudstone; Partially Weathered Rock
30	198.63				
35	193.63				
40	188.63				
45	183.63				
50					

Well: MW-6
TOC Elev.: 231.10'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/23/2015 **Well ID#** MW-6

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 26 **(ft.)**
For multiple wells list all depths if different (example: 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	12' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
12' ft.	27' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	8' ft.	portland	trimmie
8' ft.	10' ft.	bentonite chips	pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
10' ft.	27' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	27' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 9-25-15

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-27 / MW-7

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

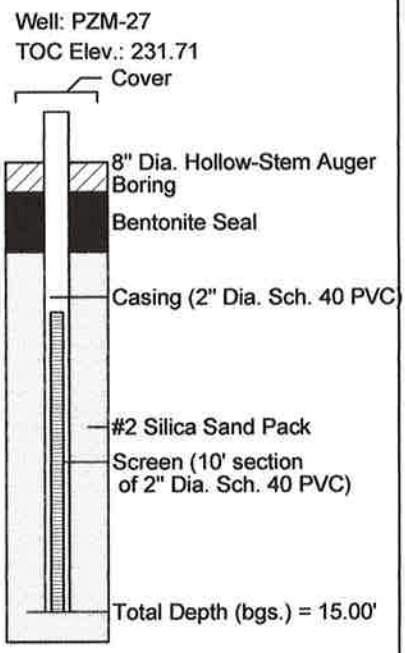
Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 231.71'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 229.53'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natual

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	229.53	1 2 3	SS	15	moist; medium; yellowish brown (10YR 5/6) with light orange mottles; silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	224.53	6 9 12	SS	14	moist; very stiff; dark reddish brown (2.5YR 3/3) with dark gray and white specks; fine to medium sandy silty clay; low plasticity; cohesive; Residuum
10	219.53	25 50/3"	SS	12	dry; very hard; reddish gray (2.5YR 5/1) with light orange and rust mottles; slightly clayey ine to medium sand; no plasticity; cohesive; Partially Weathered Rock
15	214.53	50/4"	SS	6	moist; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; fine to medium sandy clayey silt; very hard drilling 11-13'; no plasticity; cohesive; Partially Weathered Rock
20	209.53				
25	204.53				
30	199.53				
35	194.53				
40	189.53				
45					

Auger Refusal @ 16'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Cassell jr.

Well Contractor Name

4143-A

NC Well Contractor Certification Number

Summit-ECS

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐Agricultural
- ☐Municipal/Public
- ☐Geothermal (Heating/Cooling Supply)
- ☐Residential Water Supply (single)
- ☐Industrial/Commercial
- ☐Residential Water Supply (shared)
- ☐Irrigation

Non-Water Supply Well:

- ☑Monitoring
- ☐Recovery

Injection Well:

- ☐Aquifer Recharge
- ☐Groundwater Remediation
- ☐Aquifer Storage and Recovery
- ☐Salinity Barrier
- ☐Aquifer Test
- ☐Stormwater Drainage
- ☐Experimental Technology
- ☐Subsidence Control
- ☐Geothermal (Closed Loop)
- ☐Tracer
- ☐Geothermal (Heating/Cooling Return)
- ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 12/2/14 **Well ID#** pzm-27 / mw-7 CZK

5a. Well Location:

Facility/Owner Name _____ Facility ID# (if applicable) _____

1315 Moncure-Flatwood rd.

Physical Address, City, and Zip

Chatham

County _____ Parcel Identification No. (PIN) _____

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 15.0' **(ft.)**

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**

If water level is above casing, use "+"

11. Borehole diameter: 8.25" **(in.)**

12. Well construction method: HSA

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
5.0' ft.	+2' ft.	2" in.	.040	pvc
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15.0' ft.	5.0' ft.	2" in.	.010	.040	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
3.0' ft.	2.0' ft.	bent.	well seal
2.0' ft.	0.0' ft.	port.	trimmie
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
15.0' ft.	3.0' ft.	well sand	trickle down
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	.7 ft.	top soil
.7 ft.	ft.	
ft.	4.0 ft.	tan fi sa si
4.2 ft.	ft.	brn, reddish , tri si
ft.	ft.	
ft.	ft.	
ft.	15.0' ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLNOMAN

22. Certification:

Signature of Certified Well Contractor _____ Date 12-15-14

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:

Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-8

Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

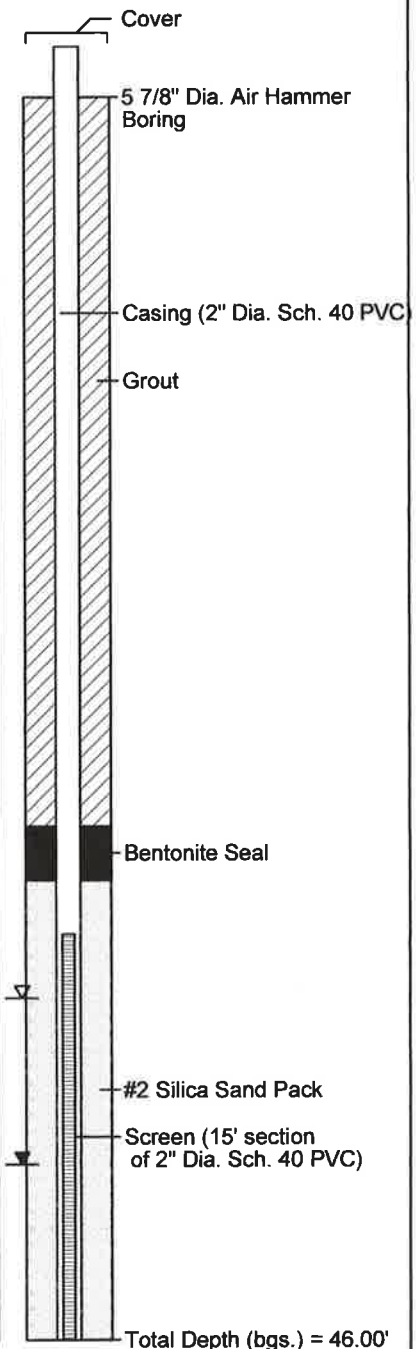
Date Started:	: 6/24/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/24/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 236.47' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 233.41' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	natural; 15' N. PZM-28

Water Levels
▼ 1 Hour = 39.50' bgs
▽ 24 Hours = 33.36' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	233.41				See Boring Log PZM-28 for detailed hollow-stem auger and split spoon sampling data from 0-24' bgs (attached). MW-8 is located 15' N. of PZM-28.
5	228.41				
10	223.41				
15	218.41				
20	213.41				
25	208.41		cuttings		dry; yellowish red (5YR 5/6); silty mudstone fragments; medium hard drilling
30	203.41		cuttings		dry; reddish brown (5YR 5/4); sandy clayey silt with mudstone fragments; soft drilling
35	198.41		cuttings		dry; reddish brown (5YR 5/4); sandy clayey silt with mudstone fragments; medium hard drilling
40	193.41		cuttings		wet; reddish brown (5YR 4/3); medium sand silt with mudstone fragments; soft drilling
45	188.41		cuttings		wet; reddish brown (5YR 4/3); medium sand silt with mudstone fragments; hard drilling
50					

Well: MW-8
TOC Elev.: 236.47'



Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-28 (Adjacent to MW-8)

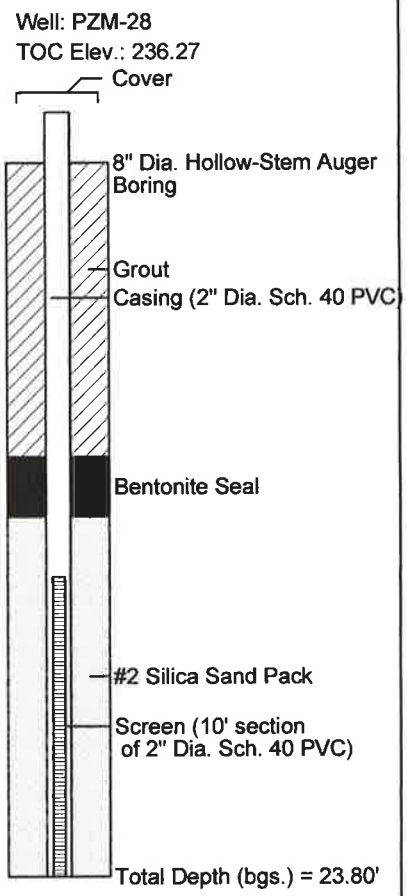
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 236.12'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 234.12'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natual; 15' S. MW-8

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	234.12	3 4 7	SS	22	moist; stiff; yellowish red (5YR 5/6) with orange mottles; fine sandy silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	229.12	16 17 26	SS	18	moist/dry; very hard; reddish brown (5YR 4/4); clayey silt; no plasticity; cohesive; Residuum
10	224.12	16 50/6"	SS	12	moist; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
15	219.12	50/6"	SS	5	dry; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
20	214.12	50/3"	SS	2	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
25	209.12	50/3"	SS	4	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
30	204.12				
35	199.12				
40	194.12				
45					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐ Agricultural
- ☐ Municipal/Public
- ☐ Geothermal (Heating/Cooling Supply)
- ☐ Residential Water Supply (single)
- ☐ Industrial/Commercial
- ☐ Residential Water Supply (shared)
- ☐ Irrigation

Non-Water Supply Well:

- ☒ Monitoring
- ☐ Recovery

Injection Well:

- ☐ Aquifer Recharge
- ☐ Groundwater Remediation
- ☐ Aquifer Storage and Recovery
- ☐ Salinity Barrier
- ☐ Aquifer Test
- ☐ Stormwater Drainage
- ☐ Experimental Technology
- ☐ Subsidence Control
- ☐ Geothermal (Closed Loop)
- ☐ Tracer
- ☐ Geothermal (Heating/Cooling Return)
- ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/24/2015 **Well ID#** MW-8

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒ Permanent or ☐ Temporary

7. Is this a repair to an existing well: ☐ Yes or ☒ No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 46 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: _____ (in.)

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	31' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
31' ft.	46' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	27' ft.	portland	trimmie
27' ft.	29' ft.	bentonite chips	pwr
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
29' ft.	46' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	46' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KL NOMAN 6-25-15

21. REMARKS

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, BG-1

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

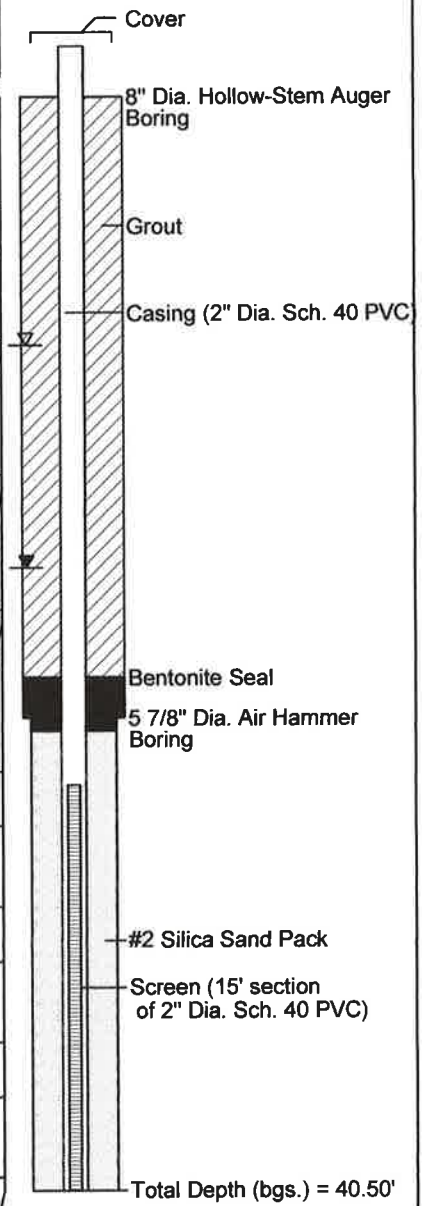
Date Started:	: 7/30/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 7/30/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 228.19' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 225.64' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	natural

Water Levels
- 1 Hour = 16.50' bgs
- 24 Hours = 9.00' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	225.64				
5	220.64	4 5 5	SS	16	moist; medium; pinkish gray (7.5YR 6/2) with light orange mottles; fine sandy silty clay; cohesive; high plasticity; Soil Horizon
10	215.64	50/4"	SS	3	dry; very hard; dark red (2.5YR 3/6); medium horizontal fissile; weathered mudstone; Partially Weathered Rock
15	210.64	50/2"	SS	3	dry; very hard; dark red (2.5YR 3/6) with gray horizontal bands; silty fine to coarse sand and muddy sandstone gravel; Partially Weathered Rock
20	205.64	50/4"	SS	6	dry; very hard; weak red (10YR 5/3); horizontal fissile; sandy mudstone; Partially Weathered Rock; Auger Refual @ 23'
25	200.64		cuttings		dry; red (10R 4/6); silt with mudstone fragments; hard drilling
30	195.64		cuttings		dry; red (10R 5/6); silt with mudstone fragments; medium hard drilling
35	190.64		cuttings		dry; red (10R 5/6); silt with mudstone fragments; medium hard drilling
40	185.64		cuttings		dry; weak red (10R 5/3); silt with mudstone fragments; hard drilling
45	180.64				
50					

Well: BG-1
TOC Elev.: 228.19'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284-A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 07/30/2015 **Well ID#** BG-1

5a. Well Location:

Moncure Clay MIne
Facility/Owner Name
Facility ID# (if applicable)

1315 Moncure-Flatwood Road, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County
Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 41 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	26' ft.	2' in.	SCH 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
26' ft.	41' ft.	2' in.	.010	SCH 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0.0 ft.	22' ft.	portland cementmmie	
22' ft.	24' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
24' ft.	41' ft.	SILICA SAND	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
o.o ft.	20' ft.	red silty clay
20' ft.	41' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 9-25-15

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor

7/31/2015
Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

APPENDIX B
MONITOR WELL SURVEY DATA – MCADAMS

Brickhaven No.2 Mine Tract A
Monitoring Well Locations

Description	Northing	Easting	Top Concrete Elev.	Top Well Casing	Top of pipe
MW-2	673677.0735	1994537.5362	227.45	230.47	229.97
MW-1~~-1D~~	674737.9802	1993417.6879	277.28	280.45	280.08
MW-3	672474.6258	1994834.7635	220.00	222.99	222.56
MW-8	673304.8301	1992200.3716	233.41	236.92	236.47
MW-6	671267.5989	1992793.3436	228.63	231.54	231.10
Guardhouse	670898.4966	1996348.2508	225.64	228.8	228.19

Notes: Well observations were take on 7/27/2015
Bearings for this survey are based on NAD 83
Elevations for this survey are based on NAVD 88

NORTH CAROLINA
PROFESSIONAL
SEAL
L-4[illegible]
LAND SURVEYOR
8/5/2015
GREGORY C. DEWLEY

APPENDIX C
RISING HEAD SLUG TEST DATA AND HYDRAULIC CONDUCTIVITY RESULTS

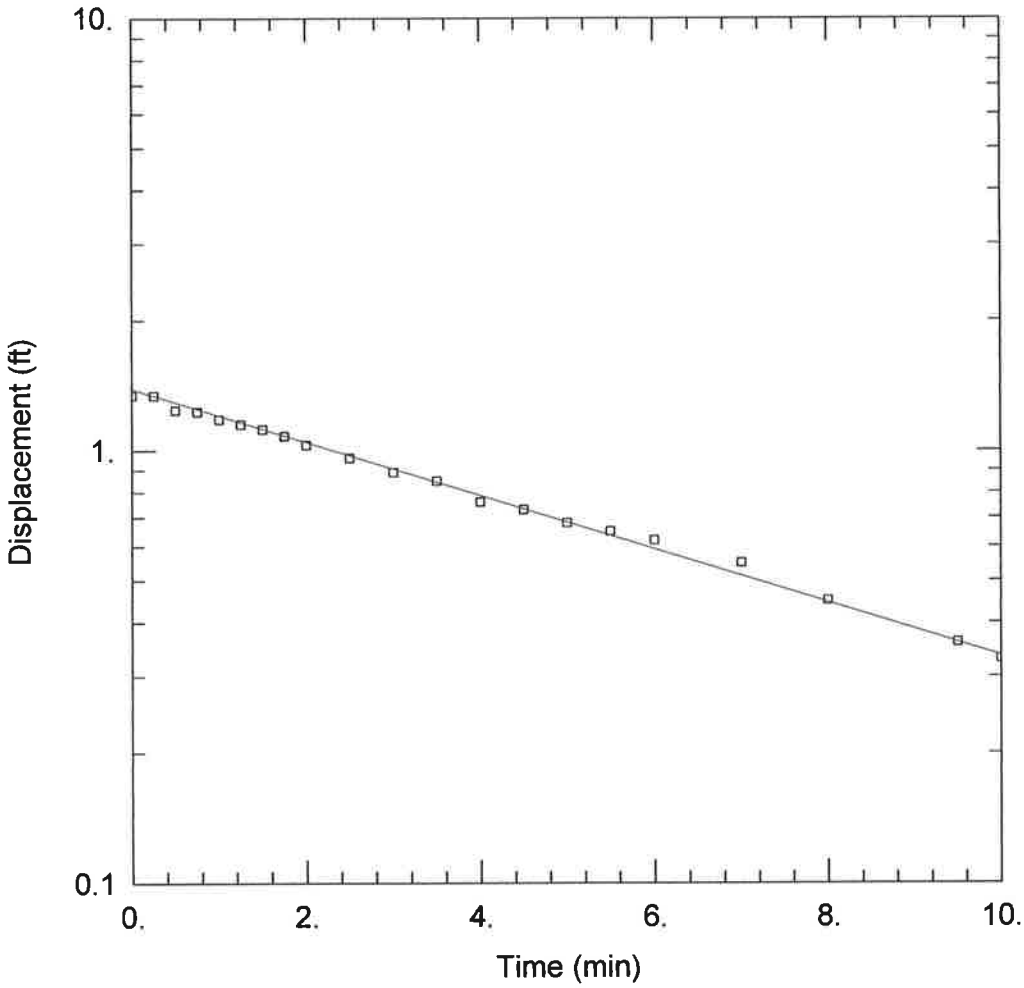
BG-1
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.34'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 40.50'
Total Depth Well Below Top-of-Casing (BTOC): 43.05'
Static Depth-to-Water BTOC: 12.46'
Static Height of Water in Well: 30.59'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	12.46		
0.25	13.80	12.46	1.34
0.50	13.70	12.46	1.24
0.75	13.69	12.46	1.23
1.00	13.64	12.46	1.18
1.25	13.61	12.46	1.15
1.50	13.58	12.46	1.12
1.75	13.54	12.46	1.08
2.00	13.49	12.46	1.03
2.50	13.42	12.46	0.96
3.00	13.35	12.46	0.89
3.50	13.31	12.46	0.85
4.00	13.22	12.46	0.76
4.50	13.19	12.46	0.73
5.00	13.14	12.46	0.68
5.50	13.11	12.46	0.65
6.00	13.08	12.46	0.62
7.00	13.01	12.46	0.55
8.00	12.91	12.46	0.45
9.50	12.82	12.46	0.36
10.00	12.79	12.46	0.33

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.BG-1



RISING HEAD SLUG TEST - BG-1

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickBG-1.aqt
Date: 09/28/15 Time: 16:44:11

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: BG-1
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 30.59 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.34 ft
Total Well Penetration Depth: 40.5 ft
Casing Radius: 0.083 ft
Static Water Column Height: 30.59 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 7.761E-5 cm/sec
y0 = 1.389 ft

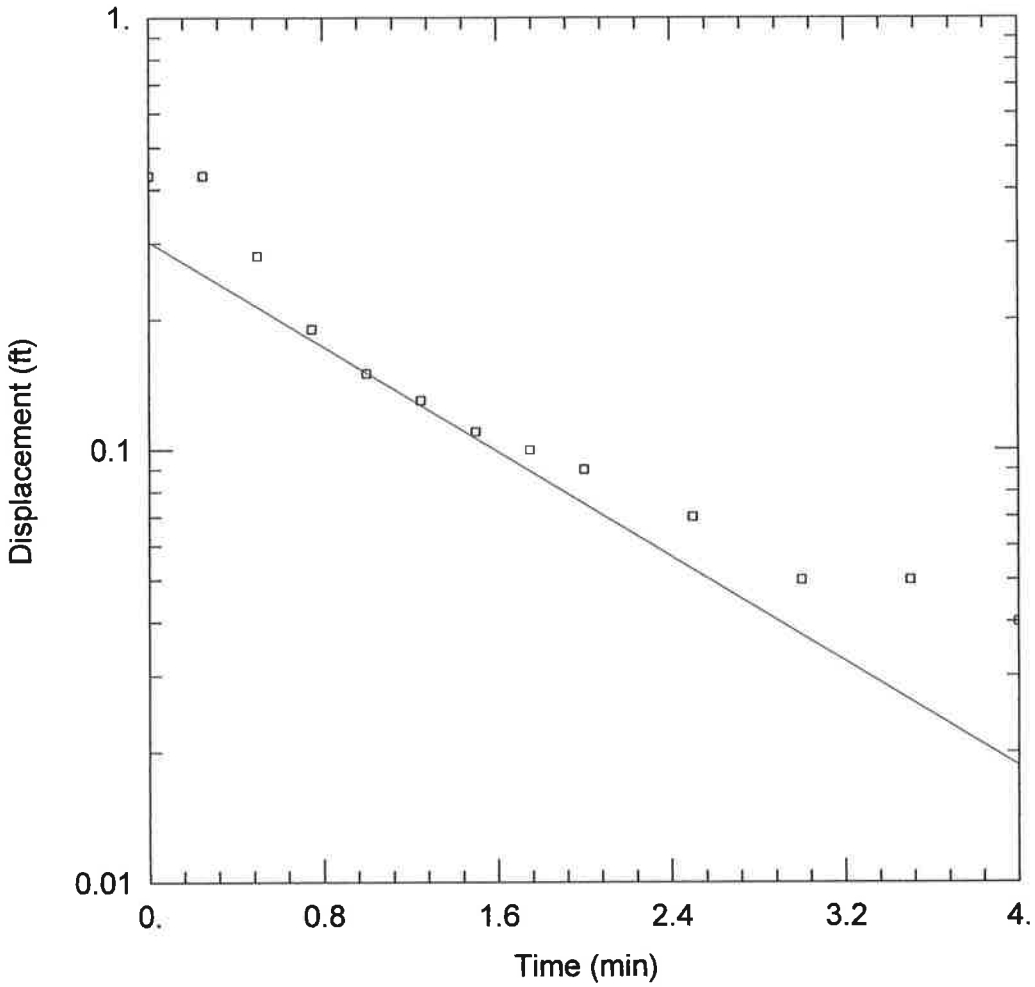
MW-1
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.43'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 72.50'
Total Depth Well Below Top-of-Casing (BTOC): 75.30'
Static Depth-to-Water BTOC: 59.97'
Static Height of Water in Well: 15.33'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	59.97		
0.25	60.40	59.97	0.43
0.50	60.25	59.97	0.28
0.75	60.16	59.97	0.19
1.00	60.12	59.97	0.15
1.25	60.10	59.97	0.13
1.50	60.08	59.97	0.11
1.75	60.07	59.97	0.10
2.00	60.06	59.97	0.09
2.50	60.04	59.97	0.07
3.00	60.02	59.97	0.05
3.50	60.02	59.97	0.05
4.00	60.01	59.97	0.04

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (2) bailers of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-1



RISING HEAD SLUG TEST - MW-1

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-1.aqt
Date: 09/28/15 Time: 15:57:06

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-1
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 15.33 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.43 ft
Total Well Penetration Depth: 72.5 ft
Casing Radius: 0.083 ft
Static Water Column Height: 15.33 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0004105 cm/sec
y0 = 0.3027 ft

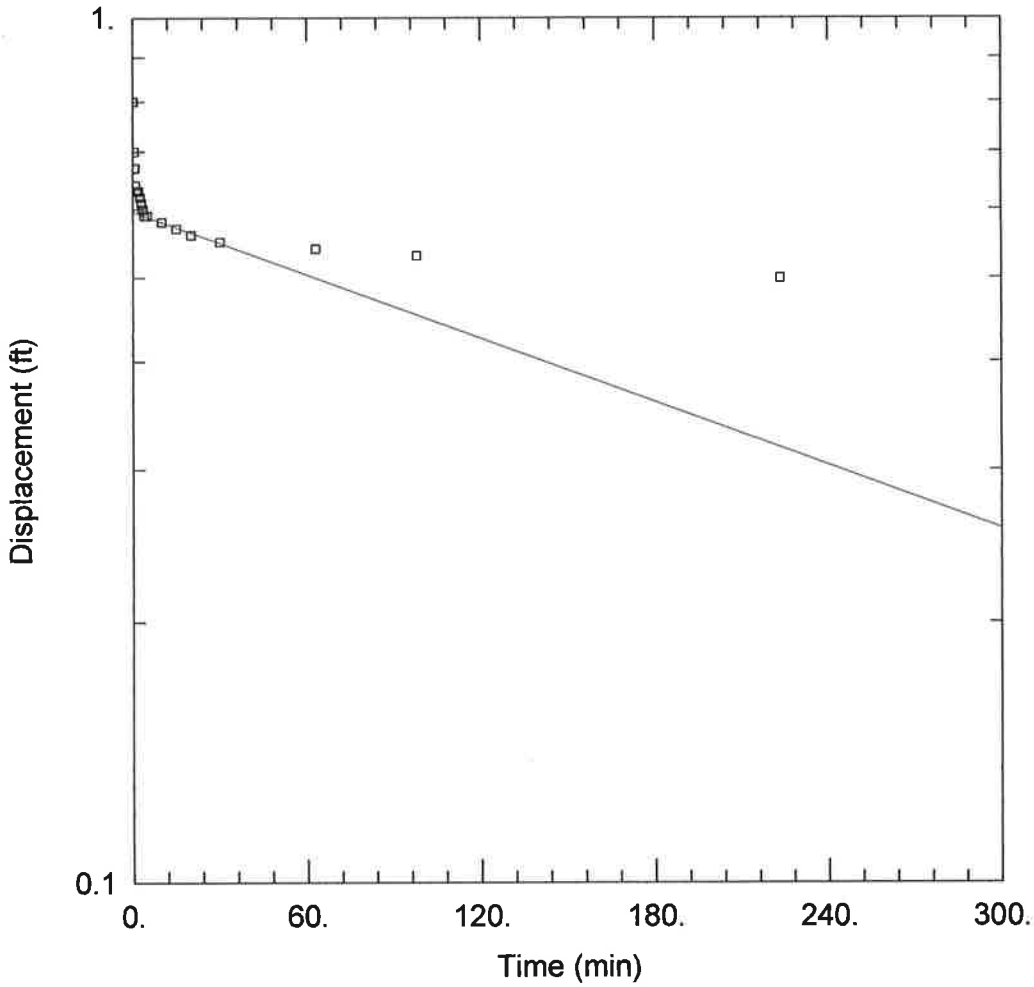
MW-2
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.80'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 45.00'
Total Depth Well Below Top-of-Casing (BTOC): 47.52'
Static Depth-to-Water BTOC: 40.98'
Static Height of Water in Well: 6.54'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	40.98		
0.25	41.78	40.98	0.80
0.50	41.68	40.98	0.70
0.75	41.65	40.98	0.67
1.00	41.62	40.98	0.64
1.50	41.61	40.98	0.63
2.00	41.61	40.98	0.63
2.50	41.60	40.98	0.62
3.00	41.59	40.98	0.61
3.50	41.58	40.98	0.60
4.00	41.57	40.98	0.59
5.00	41.57	40.98	0.59
10.00	41.56	40.98	0.58
15.00	41.55	40.98	0.57
20.00	41.54	40.98	0.56
30.00	41.53	40.98	0.55
63.00	41.52	40.98	0.54
98.00	41.51	40.98	0.53
223.00	41.48	40.98	0.50

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-2



RISING HEAD SLUG TEST - MW-2

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-1.aqt
Date: 09/28/15 Time: 16:02:26

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-2
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.8 ft
Total Well Penetration Depth: 45. ft
Casing Radius: 0.083 ft
Static Water Column Height: 6.54 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.405E-6 cm/sec
y0 = 0.5962 ft

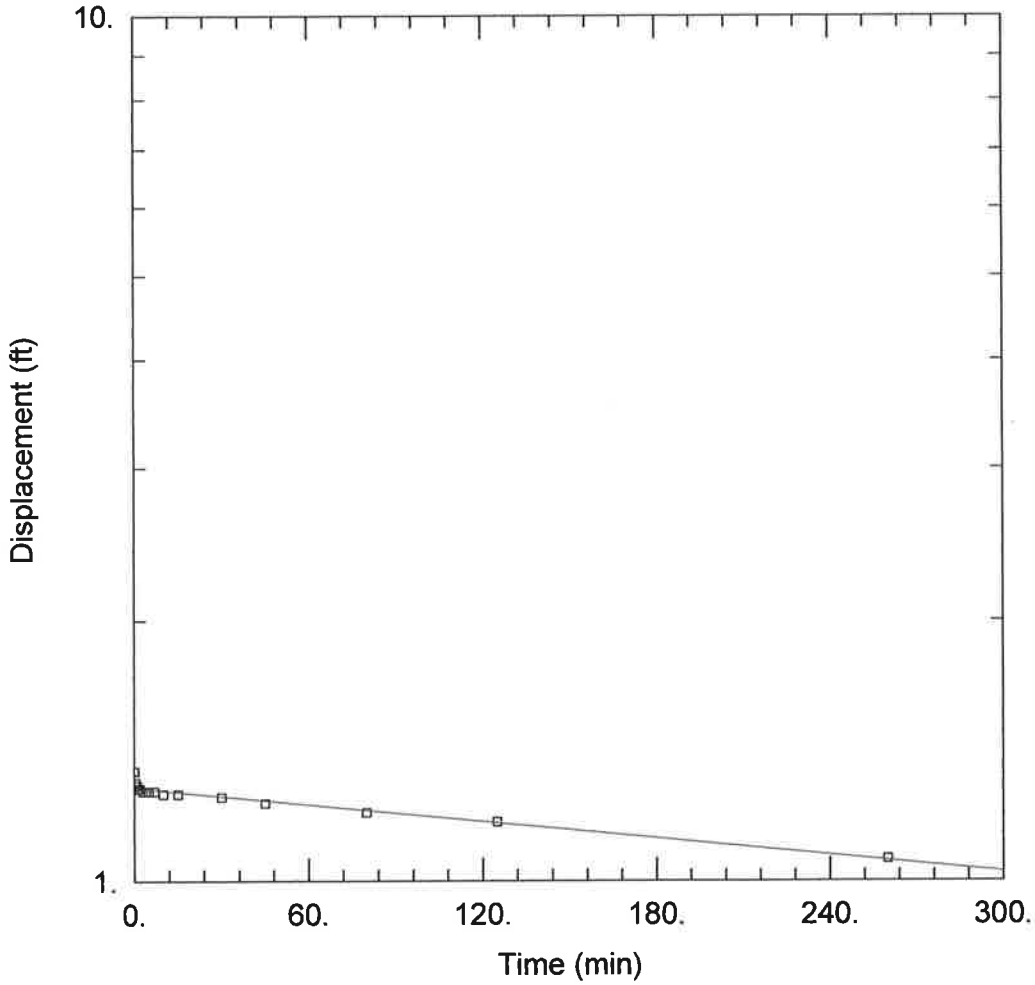
MW-3
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.34'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 40.80'
Total Depth Well Below Top-of-Casing (BTOC): 43.36'
Static Depth-to-Water BTOC: 15.55'
Static Height of Water in Well: 27.81'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	15.55		
0.25	16.89	15.55	1.34
0.50	16.85	15.55	1.30
0.75	16.84	15.55	1.29
1.00	16.84	15.55	1.29
1.50	16.83	15.55	1.28
2.00	16.83	15.55	1.28
3.00	16.82	15.55	1.27
4.00	16.82	15.55	1.27
5.00	16.82	15.55	1.27
7.00	16.82	15.55	1.27
10.00	16.81	15.55	1.26
15.00	16.81	15.55	1.26
30.00	16.80	15.55	1.25
45.00	16.78	15.55	1.23
80.00	16.75	15.55	1.20
125.00	16.72	15.55	1.17
260.00	16.61	15.55	1.06

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-3



RISING HEAD SLUG TEST - MW-3

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-3.aqt
Date: 09/28/15 Time: 16:12:02

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-3
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 27.81 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.34 ft
Total Well Penetration Depth: 40.8 ft
Casing Radius: 0.083 ft
Static Water Column Height: 27.81 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 4.076E-7 cm/sec
y0 = 1.281 ft

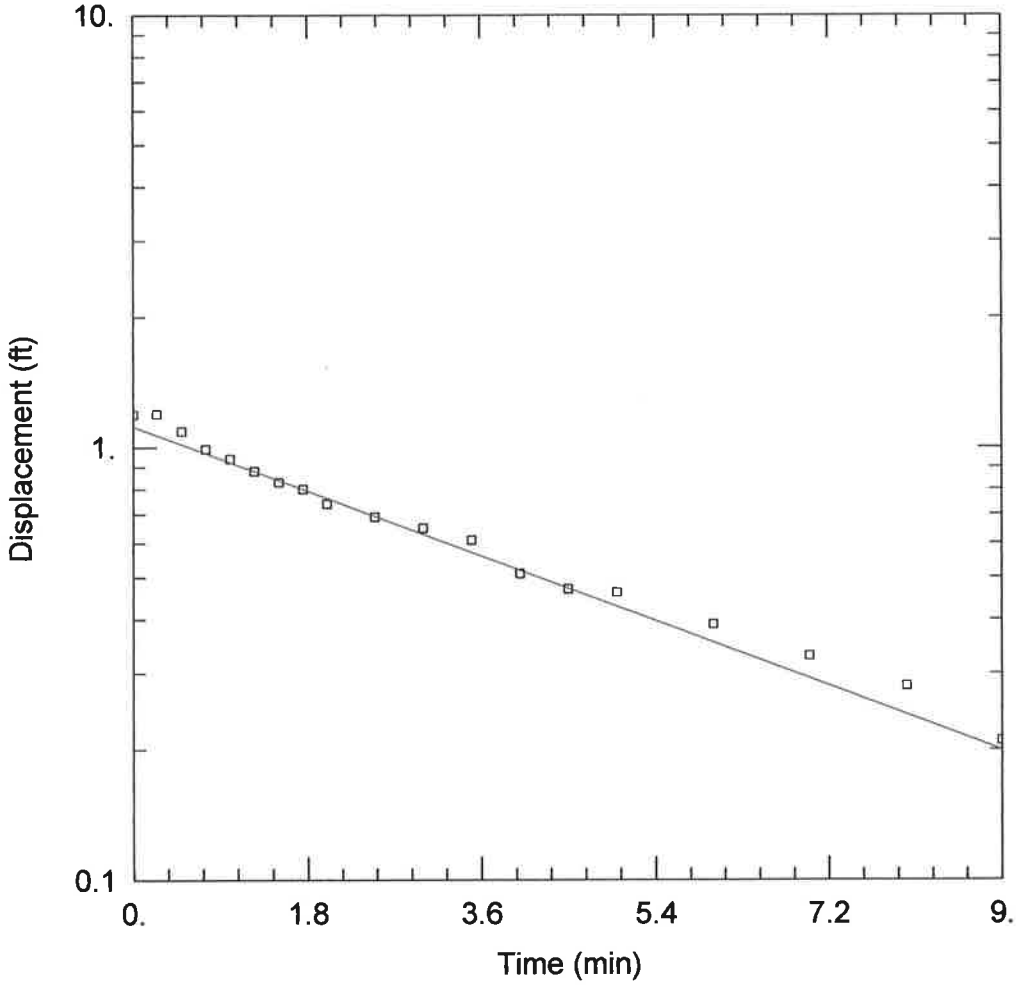
PZM-1 / MW-4
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.19'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 22.70'
Total Depth Well Below Top-of-Casing (BTOC): 25.65'
Static Depth-to-Water BTOC: 11.61'
Static Height of Water in Well: 14.04'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	11.61		
0.25	12.80	11.61	1.19
0.50	12.70	11.61	1.09
0.75	12.60	11.61	0.99
1.00	12.55	11.61	0.94
1.25	12.49	11.61	0.88
1.50	12.44	11.61	0.83
1.75	12.41	11.61	0.80
2.00	12.35	11.61	0.74
2.50	12.30	11.61	0.69
3.00	12.26	11.61	0.65
3.50	12.22	11.61	0.61
4.00	12.12	11.61	0.51
4.50	12.08	11.61	0.47
5.00	12.07	11.61	0.46
6.00	12.00	11.61	0.39
7.00	11.94	11.61	0.33
8.00	11.89	11.61	0.28
9.00	11.82	11.61	0.21

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.PZM-1/MW-4



RISING HEAD SLUG TEST - PZM-1 / MW-4

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\PZM-1.aqt
Date: 09/29/15 Time: 11:49:11

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Moncure Mine
Test Well: PZM-1 / MW-4
Test Date: 9/18/2014

AQUIFER DATA

Saturated Thickness: 14.04 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.19 ft
Total Well Penetration Depth: 22.7 ft
Casing Radius: 0.083 ft
Static Water Column Height: 14.04 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001413 cm/sec
y0 = 1.117 ft

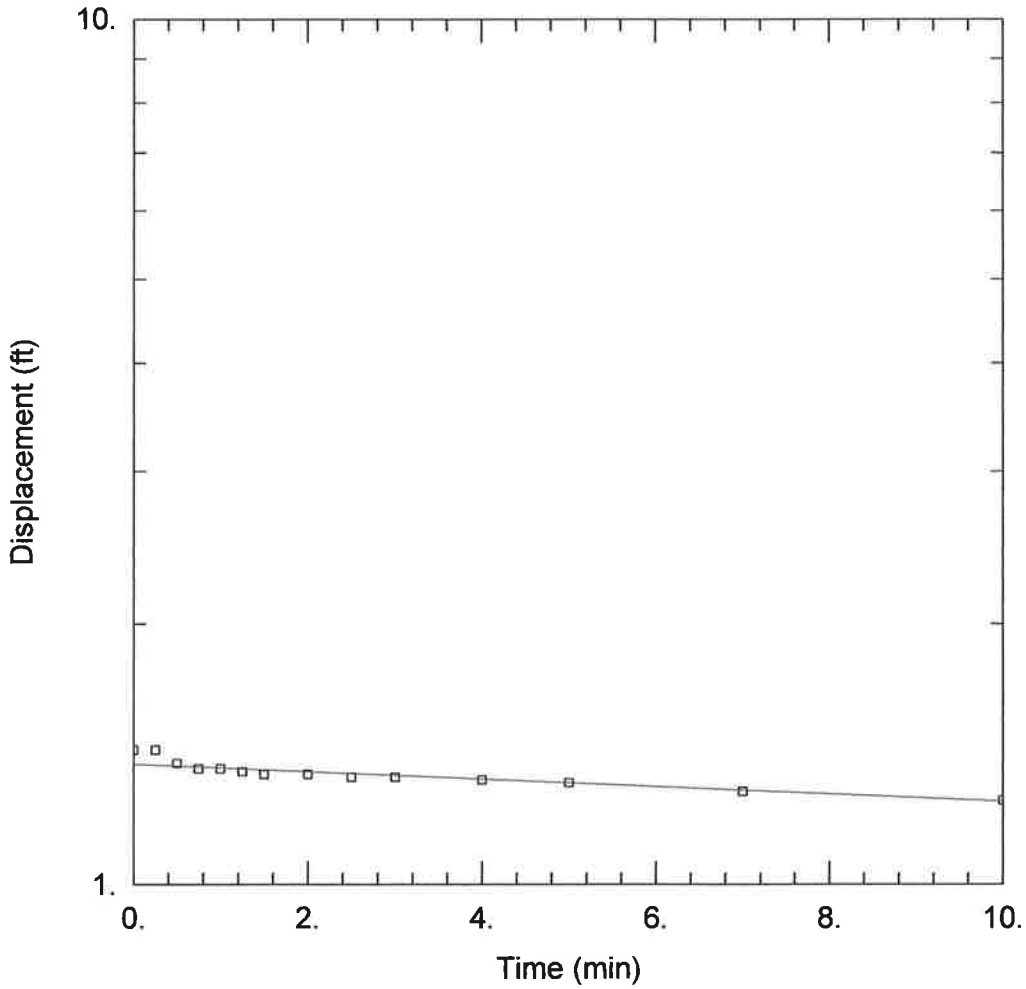
PZM-22 / MW-5
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.43'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 44.40'
Total Depth Well Below Top-of-Casing (BTOC): 46.54'
Static Depth-to-Water BTOC: 14.17'
Static Height of Water in Well: 32.37'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	14.17		
0.25	15.60	14.17	1.43
0.50	15.55	14.17	1.38
0.75	15.53	14.17	1.36
1.00	15.53	14.17	1.36
1.25	15.52	14.17	1.35
1.50	15.51	14.17	1.34
2.00	15.51	14.17	1.34
2.50	15.50	14.17	1.33
3.00	15.50	14.17	1.33
4.00	15.49	14.17	1.32
5.00	15.48	14.17	1.31
7.00	15.45	14.17	1.28
10.00	15.42	14.17	1.25

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-5



RISING HEAD SLUG TEST - PZM-22 / MW-5

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-5.aqt
Date: 09/28/15 Time: 16:23:54

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-5
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 32.37 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.43 ft
Total Well Penetration Depth: 44.4 ft
Casing Radius: 0.083 ft
Static Water Column Height: 32.37 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.01E-6 cm/sec
y0 = 1.376 ft

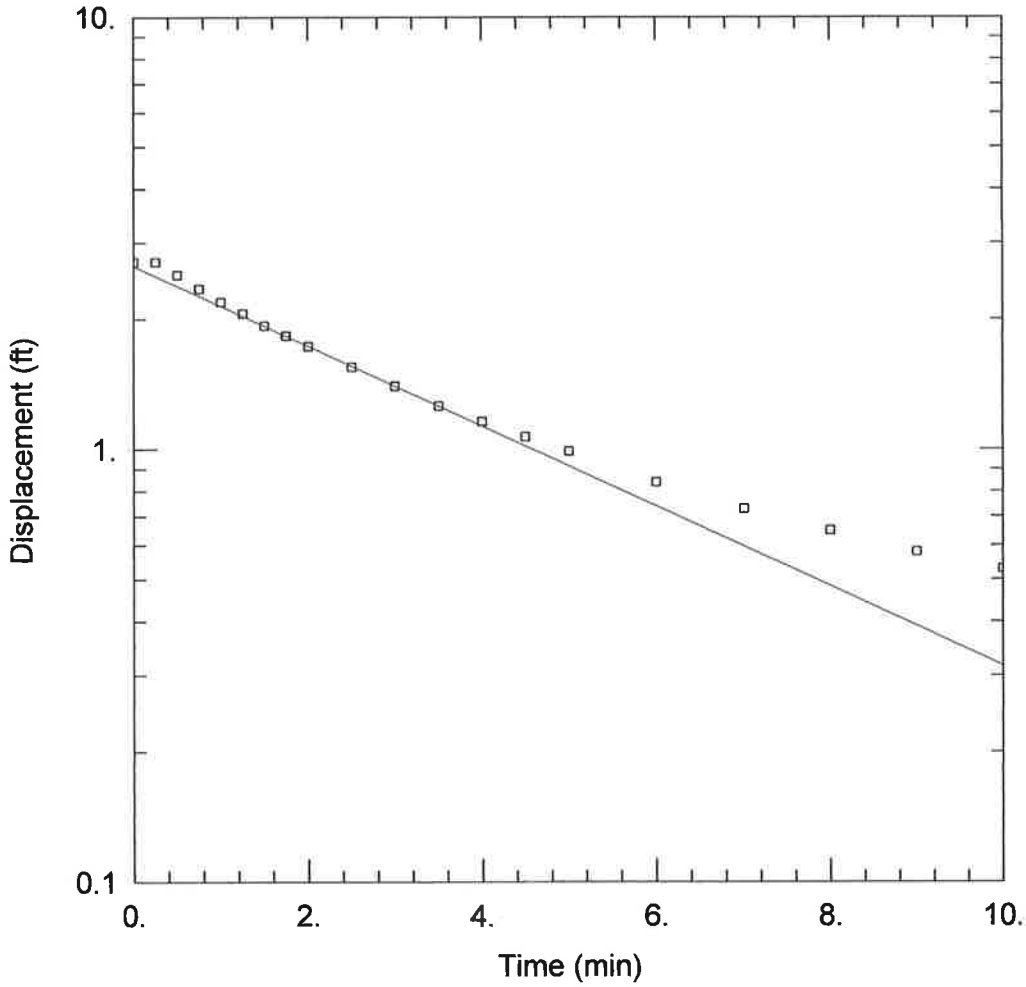
MW-6
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 2.71'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 27.00'
Total Depth Well Below Top-of-Casing (BTOC): 29.47'
Static Depth-to-Water BTOC: 8.25'
Static Height of Water in Well: 21.22'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	8.25		
0.25	10.96	8.25	2.71
0.50	10.78	8.25	2.53
0.75	10.60	8.25	2.35
1.00	10.44	8.25	2.19
1.25	10.31	8.25	2.06
1.50	10.18	8.25	1.93
1.75	10.08	8.25	1.83
2.00	9.98	8.25	1.73
2.50	9.80	8.25	1.55
3.00	9.65	8.25	1.40
3.50	9.51	8.25	1.26
4.00	9.41	8.25	1.16
4.50	9.32	8.25	1.07
5.00	9.24	8.25	0.99
6.00	9.09	8.25	0.84
7.00	8.98	8.25	0.73
8.00	8.90	8.25	0.65
9.00	8.83	8.25	0.58
10.00	8.78	8.25	0.53

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (2) bailers of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-6



RISING HEAD SLUG TEST - MW-6

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-6.aqt
Date: 09/28/15 Time: 16:31:56

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-6
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 21.22 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 2.71 ft
Total Well Penetration Depth: 27. ft
Casing Radius: 0.083 ft
Static Water Column Height: 21.22 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001097 cm/sec
y0 = 2.65 ft

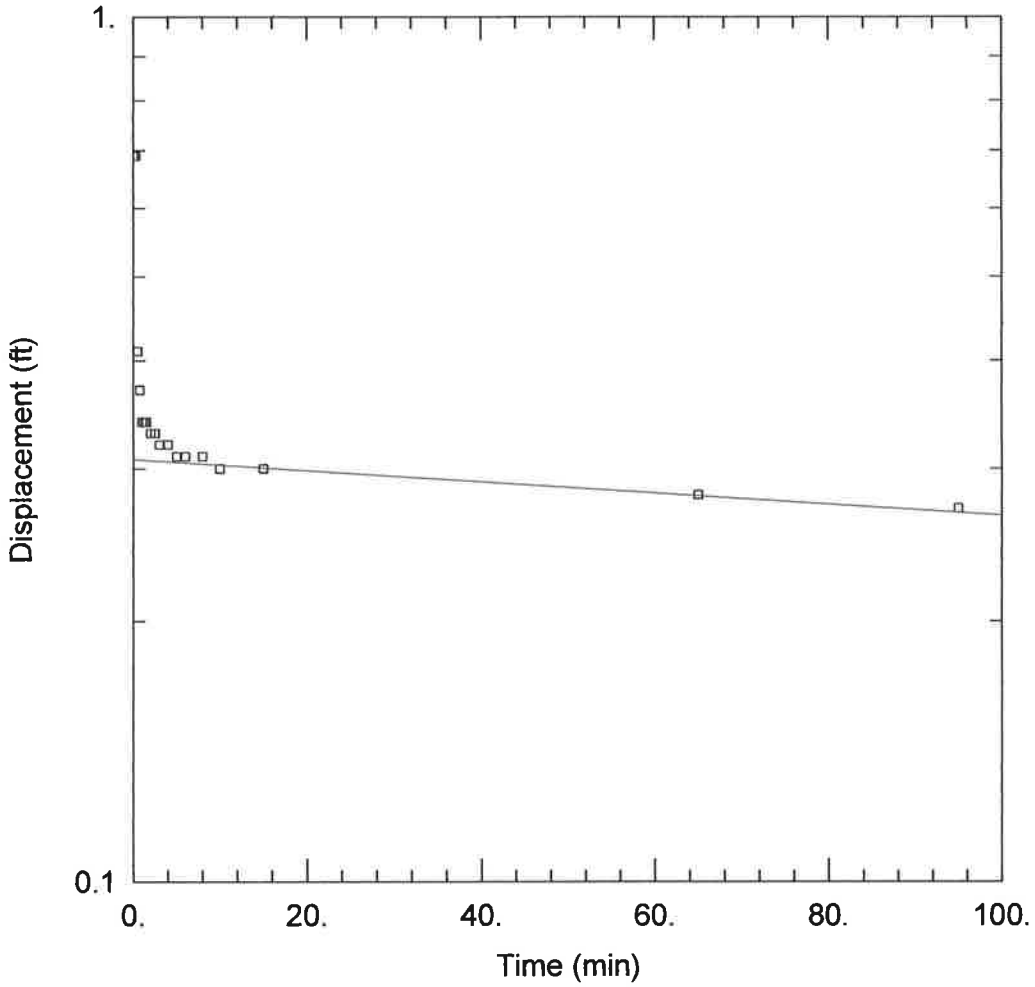
MW-7
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.69'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 15.00'
Total Depth Well Below Top-of-Casing (BTOC): 17.18'
Static Depth-to-Water BTOC: 9.11'
Static Height of Water in Well: 8.07'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	9.11		
0.25	9.80	9.11	0.69
0.50	9.52	9.11	0.41
0.75	9.48	9.11	0.37
1.00	9.45	9.11	0.34
1.25	9.45	9.11	0.34
1.50	9.45	9.11	0.34
2.00	9.44	9.11	0.33
2.50	9.44	9.11	0.33
3.00	9.43	9.11	0.32
4.00	9.43	9.11	0.32
5.00	9.42	9.11	0.31
6.00	9.42	9.11	0.31
8.00	9.42	9.11	0.31
10.00	9.41	9.11	0.30
15.00	9.41	9.11	0.30
65.00	9.39	9.11	0.28
95.00	9.38	9.11	0.27

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-7



RISING HEAD SLUG TEST - MW-7

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-7.aqt
Date: 09/28/15 Time: 16:35:56

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-7
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 8.07 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.69 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 8.07 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.264E-6 cm/sec
y0 = 0.3075 ft

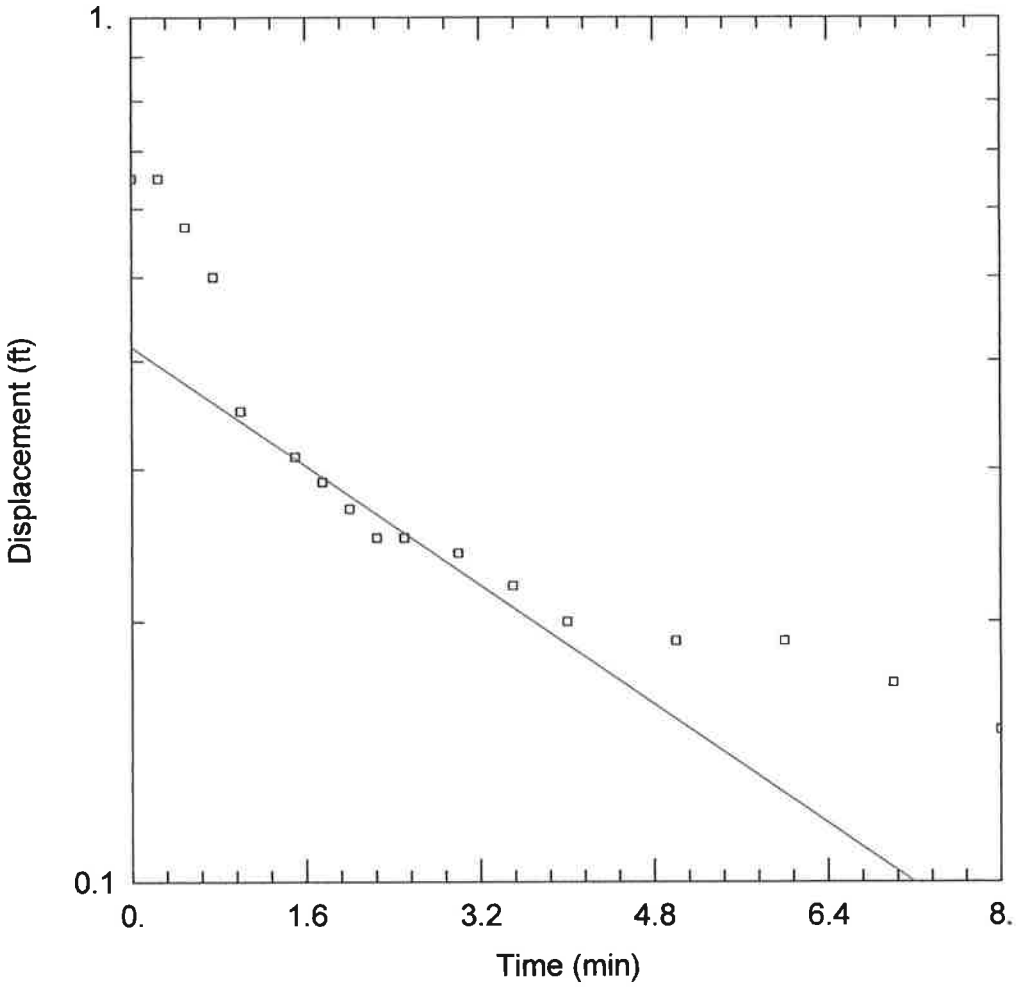
MW-8
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.65'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 46.00'
Total Depth Well Below Top-of-Casing (BTOC): 49.06'
Static Depth-to-Water BTOC: 36.40'
Static Height of Water in Well: 12.66'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	36.40		
0.25	37.05	36.40	0.65
0.50	36.97	36.40	0.57
0.75	36.90	36.40	0.50
1.00	36.75	36.40	0.35
1.50	36.71	36.40	0.31
1.75	36.69	36.40	0.29
2.00	36.67	36.40	0.27
2.25	36.65	36.40	0.25
2.50	36.65	36.40	0.25
3.00	36.64	36.40	0.24
3.50	36.62	36.40	0.22
4.00	36.60	36.40	0.20
5.00	36.59	36.40	0.19
6.00	36.59	36.40	0.19
7.00	36.57	36.40	0.17
8.00	36.55	36.40	0.15

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-8



RISING HEAD SLUG TEST - MW-8

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-8.aqt
Date: 09/28/15 Time: 16:39:34

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-8
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 12.66 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.65 ft
Total Well Penetration Depth: 46. ft
Casing Radius: 0.083 ft
Static Water Column Height: 12.66 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001289 cm/sec
y0 = 0.4152 ft

B

Appendix B – Initial Background Groundwater and Surface Water Monitoring Event Report (August 2015)

DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Ross Klingman, P.G. Phone: 704-344-1450

E-mail: buxtonenv@bellsouth.net

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Brickhaven No. 2 Mine Tract "A"	1271 Moncure-Flatwood Road Chatham County Moncure, North Carolina	1910-STRUCT-2015	CAMA	August 12 & 13, 2015

Environmental Status: (Check all that apply)

☒ Initial/Background Monitoring ☐ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☐ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Ross Klingman, P.G. President 704-344-1450

Facility Representative Name (Print) Title (Area Code) Telephone Number

Signature October 28, 2015 Date

Affix NC Licensed/Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 10-28-15

Buxton Environmental, Inc.; 1101 South Blvd., Suite 101; Charlotte, NC 28203

Facility Representative Address

C-278

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

INITIAL BACKGROUND GROUNDWATER & SURFACE WATER MONITORING EVENT
FIRST (1ST) OF EIGHT (8) EVENTS – AUGUST 12 & 13, 2015
BRICKHAVEN NO. 2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA
PERMIT NO.: 1910-STRUCT-2015

Prepared for:

Mr. Mike Plummer, PE
HDR Engineering of the Carolinas, Inc.
440 South Church Street, Suite 1000
Charlotte, North Carolina 28202
Ph: 704-338-6843

October 28, 2015

Prepared by:

Ross Klingman, P.G.
Senior Geologist

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

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buxtonenv@bellsouth.net

INITIAL BACKGROUND GROUNDWATER & SURFACE WATER MONITORING EVENT
FIRST (1ST) OF EIGHT (8) EVENTS – AUGUST 12 & 13, 2015
BRICKHAVEN NO. 2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA
PERMIT NO.: 1910-STRUCT-2015

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INITIAL BACKGROUND GROUNDWATER & SURFACE WATER MONITORING EVENT
FIRST (1ST) OF EIGHT (8) EVENTS – AUGUST 12 & 13, 2015
BRICKHAVEN NO. 2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA
PERMIT NO.: 1910-STRUCT-2015

1.0 INTRODUCTION

Buxton Environmental, Inc. respectfully submits the methods and results of the initial background groundwater & surface water monitoring event conducted at the Brickhaven No. 2 Mine Tract "A" Structural Fill Site located at 1271 Moncure-Flatwood Road in Moncure, Chatham County, North Carolina (Permit No.: 1910-STRUCT-2015). These activities were conducted in general accordance with North Carolina Department of Environmental Quality (formerly North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management, Solid Waste Section (NCSWS) 15A NCAC 13B Rules and guidelines; the *Design Hydrogeologic Report – Addendum, Revision 2* (including the *Water Quality Monitoring Plan)* prepared on March 6, 2015 by Buxton Environmental, Inc. for the Brickhaven site; the subsequent the *Water Quality Monitoring Plan* prepared by Buxton Environmental, Inc. and submitted to NCSWS as a stand-alone document by HDR Engineering of the Carolinas, Inc. (HDR) on March 23, 2015; the *Permit to Construct/Permit to Operate* (pertaining to Attachment 3-Conditions of Construction-Line Number 7) which was issued for the site by the NCSWS on June 5, 2015; and a modification to the approved *Water Quality Monitoring Plan*. According to the *Permit to Construct/Permit to Operate*- Attachment 3-Conditions of Construction-Line Number 7, a minimum of one (1) independent background sample (of a total of eight (8) independent background sampling events) is required to be collected from each compliance groundwater monitoring well and surface water sampling location, prior to the placement of coal combustion residuals at the site. The only modification to the approved *Water Quality Monitoring Plan* was the addition of EPA Appendix I volatile organic compounds (VOCs) (40 CFR 258) to the groundwater and surface water constituent sampling parameter list, as required by General Assembly of North Carolina Session 2013 - Senate Bill 729 concerning coal combustion residuals (a.k.a. Coal Ash Management Act of 2014 (CAMA)). During the preparation of the March 2015 *Water Quality Monitoring Plan*, the NCSWS verbally indicated that VOC analysis would not be required at the site, however, VOCs have been added to comply with Senate Bill 729. A Site Location Map and a Groundwater Monitoring System Map are provided in Figures 1 and 2, respectively.

A summary of background information, and the methods, results, conclusions and recommendations of this assessment are outlined below.

2.0 BACKGROUND INFORMATION

The Brickhaven No. 2 Mine Tract "A" Structural Fill Site is located in Chatham County, approximately four miles southwest of central Moncure, North Carolina. According to the Chatham County GIS website, the subject property (PIN #: 9697-32-0803) is 333.55 acres and is owned Green Meadow, LLC. The structural coal combustion residual fill area comprises approximately 149 acres of the subject property. The property located within the structural fill area was most recently owned by General Shale Brick, Inc., which operated the site as a clay mine since at least the early 1990's for their off-site brick manufacturing facility. The area immediately surrounding the site primarily consists of rural residential (approximately 2,500 feet east, 1,000 feet southeast and 1,000 feet southwest), commercial, industrial, wooded and agricultural property. According to information obtained from the Chatham County GIS website, municipal water supply is available to the surrounding area.

The subject site is located in the Triassic Basin Belt of the Piedmont Physiographic Province, according to the 1985 *North Carolina Geologic Map* prepared by the North Carolina Geological Survey. The structural fill portion of the subject property is located within the Sanford Formation (T_{RCS}), which is described in the *North Carolina Geologic Map* as consisting of sedimentary formations containing conglomerate, fanglomerate, sandstone and mudstone.

The original approved *Water Quality Monitoring Plan* (March 2015) stipulated the installation of one (1) upgradient background monitor well (MW-1) and seven (7) downgradient/sidegradient monitor wells (MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8) to be installed at the review boundary outside and adjacent to the structural fill boundary, in order to monitor groundwater quality at the site. On July 17, 2015, Mr. Ross Klingman, P.G. with Buxton Environmental, Inc. contacted Ms. Elizabeth Werner (Permitting Hydrogeologist) with the NCSWS via telephone to request the installation of an additional background monitor well (BG-1) to be installed approximately 1,500 feet to the east of the southeast corner of the structural fill boundary, near the guard house and adjacent to Moncure-Flatwood Road. At the time of the July 15, 2015 telephone conversation, water level elevations at background monitor well MW-1 appeared to be stabilizing and it was unclear if it would adequately serve as a background well. The installation of BG-1 would ensure that at least one background well was present for upcoming background (8 independent background events) and future semi-annual groundwater quality monitoring at the site. During the conversation, Ms. Werner verbally approved the installation of the additional background monitor well.

A Compliance Groundwater Monitor Well Installation, Development, Surveying & Hydraulic Conductivity Determination Activities report, which documents the installation and preparation of the groundwater water monitor well network, was prepared on October 2, 2015 by Buxton Environmental, Inc. for HDR for submittal to the NCSWS. Buxton Environmental, Inc. understands that this report was submitted to the NCSWS.

3.0 GROUNDWATER, SURFACE WATER AND QUALITY CONTROL MONITORING – AUGUST 12 & 13, 2015

On August 12 & 13, 2015, Mr. Ross Klingman, P.G. of Buxton Environmental, Inc. conducted the initial background groundwater and surface water monitoring event, prior to the placement of coal combustion residuals at the site. The monitoring activities were conducted in general accordance with NCSWS *Guidelines for Groundwater, Soil, and Surface Water Sampling* dated April 2008; and the NCDWM memorandum dated November 5, 2014 concerning electronic document submittal for routine groundwater and surface water monitoring. The groundwater samples were also collected in general accordance with U.S. Environmental Protection Agency (EPA) Region I, *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* dated January 19, 2010.

On August 12, 2015, groundwater monitoring activities were conducted utilizing low flow sampling techniques at nine groundwater monitor wells including BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 and MW-8. Monitor well locations are provided in Figure 2. Prior to commencing groundwater sampling, new plastic sheeting was placed around the well head, in order to prevent the sampling equipment from contacting the ground surface. The well lock was then removed from the protective stand-up-cover. New nitrile gloves were then donned and static groundwater levels were obtained from below the measuring point (top-of-well PVC casing) at each monitoring well to the nearest 0.01 foot with a depth-to-water electrode at each well. Groundwater gauging data is provided in Table 1. Low flow purging and sampling was conducted utilizing a stainless-steel Proactive SS Monsoon pump with flow rate controller (powered by an automobile battery), which was plumbed to new polyethylene sample tubing (1/2-inch outer diameter (OD) 3/8-inch inner diameter (ID)). The base of the pump was set at an adequate depth above the well base

to reduce turbidity. The following information was recorded at timed intervals during the purging process: 1) water levels were obtained below the measuring point; 2) flow rate controller pump dial setting; 3) purge rate and cumulative water pumped; 4) field parameters including temperature, conductivity, pH, oxygen reduction potential (ORP) and dissolved oxygen were recorded with a Horiba U-52 meter; and turbidity was recorded with a Micro-TPW meter. The Horiba U-52 and Micro-TPW meters were rented and calibrated by Enviro-Equipment, Inc. of Pineville, North Carolina. Calibration data is provided in Appendix A. The dissolved oxygen sensor malfunctioned following the initial reading at monitor wells BG-1, MW-1, MW-2, MW-4, MW-5, MW-6 and MW-8. Purging was conducted until a minimum of 3 well bore volumes (WBV's) of water had been removed and field parameters had stabilized (as was the case at BG-1, MW-1, MW-4, MW-6 and MW-7); field parameters had stabilized prior to purging 3 WBV's (as was the case at MW-5 and MW-8); or the well was going dry (as was the case at MW-2 and MW-3); then groundwater samples were collected. The water-level-meter and low flow pump were decontaminated in the field with a tap water rinse, Alconox-Liquidnox™ and tap water wash, a tap water rinse, and a distilled water rinse, prior to and following sampling at each monitoring well. Following sampling, locks were placed back on the well stand-up covers. Purge water was discharged to the ground surface at respective well heads. Well purging-field water quality measurement forms are provided in Appendix B.

Surface water monitoring was conducted on August 13, 2015 at two locations including SW-1 (located approximately 3,000 feet south of the structural fill boundary along a tributary creek to Gulf Creek) and SW-2 (located approximately 3,200 feet west of the structural fill boundary along Shaddox Creek) (Figure 1). Approximately 0.3-inches of rain occurred in the area on August 11, 2015, however, low base flow conditions appeared present during surface water sampling. New nitrile gloves were then donned prior to collecting surface water samples. Field parameters including temperature, conductivity, pH, ORP and dissolved oxygen were recorded with a Horiba U-52 meter; and turbidity was recorded with a Micro-TPW meter. Well purging-field water quality measurement forms are provided in Appendix B.

An equipment blank was collected for quality control at the monitor well MW-1 (first well sampled) location on August 12, 2015, prior to commencing with groundwater sampling at the site. The equipment blank was prepared in the field by pouring de-ionized water supplied by Shealy Environmental Services, Inc. through the Proactive SS Monsoon pump (last decontaminated by Enviro-Equipment, Inc.) into sample containers.

The groundwater, surface water and equipment blank samples were analyzed for EPA Appendix III constituents (40 CFR 257.94(b)); excluding pH which was field tested) (including boron and calcium by EPA Method 6020A; chloride, fluoride and sulfate by EPA Method 300.0; and total dissolved solids (TDS) by SM 2540C-20); EPA Appendix IV constituents (40 CFR 257.94(b)) (including antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, molybdenum, selenium and thallium by EPA Method 6020A; Mercury by EPA Method 7470A; lithium by EPA Method 200.8; and radium 226 and 228 by EPA Methods 903.1 and 904.0); additional EPA Appendix I metals (40 CRF 258) (including copper, nickel, silver, vanadium and zinc by EPA Method 6020A) which were not included in EPA Appendix III or IV; and EPA Appendix I VOC's (40 CFR 258) by EPA Method 8260B. A full list of EPA Appendix I metals and VOCs is provided in Appendix C. For additional quality control purposes, one trip blank was analyzed for EPA Appendix I VOC's. The samples were analyzed by Shealy Environmental Services, Inc. (North Carolina License # 329) in West Columbia, South Carolina or were subcontracted by Shealy Environmental Services, Inc. to GEL Laboratories LLC in Charleston, South Carolina (lithium and radium analysis). The water samples were collected in general accordance with accepted protocol, immediately placed in laboratory supplied containers, appropriately labeled (with sample identification, location, date and time), placed in a cooler with wet ice and transferred to the laboratory with chain-of-custody documentation.

The monitor wells were locked and appeared to be in good condition during the sampling event.

A potentiometric groundwater contour map was not generated during this investigation, since water levels at several monitor well locations (namely MW-1, MW-2 and MW-7) do not appear to have fully stabilized following installation and/or development activities. This will be included in subsequent reporting.

4.0 GROUNDWATER, SURFACE WATER AND QUALITY CONTROL MONITORING RESULTS – AUGUST 12 & 13, 2015

The groundwater, surface water and quality control monitoring results are presented in Table 2. Laboratory data sheets are provided in Appendix C. A summary of analytical results are provided below.

Groundwater Analytical Results

Groundwater samples collected at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8 indicated the presence of target constituents above established NCSWS - North Carolina Groundwater Protection Standards (NCGPSs)(either NCGPSs or North Carolina Groundwater Quality Standards (15A NCAC 2L)), which are summarized below. Groundwater sample MW-5 did not indicate target constituents above established NCGPSs.

Groundwater sample BG-1 reported the presence of 270,000 micrograms per liter (µg/l) chloride, a pH of 6.44, 690,000B ug/l TDS and 6.0 ug/l vanadium. A B-flag indicates the constituent was also detected in the method blank.

Groundwater sample MW-1 reported the presence of 570,000 µg/l chloride and 1,500,000 µg/l TDS.

Groundwater sample MW-2 reported the presence of 790,000 µg/l chloride, 1,700,000 ug/l TDS, 4.0 µg/l bromodichloromethane and 3.7 µg/l dibromochloromethane.

Groundwater sample MW-3 reported the presence of 990,000 µg/l chloride, 2,100,000 µg/l TDS, 1.7 µg/l bromodichloromethane and 2.6 µg/l dibromochloromethane.

Groundwater sample MW-4 reported the presence of 320,000 µg/l chloride, a pH of 6.35, 820,000 µg/l TDS, 7.6 µg/l cobalt and 5.9 µg/l vanadium.

Groundwater sample MW-6 reported the presence of 680,000B µg/l TDS.

Groundwater sample MW-7 reported the presence of 430,000 µg/l chloride, 1,100,000B µg/l TDS, 3.5 µg/l bromodichloromethane and 4.4 µg/l dibromochloromethane.

Groundwater sample MW-8 reported the presence of 470,000 µg/l chloride, 1,300,000B µg/l TDS and 1,100 µg/l barium.

According to a United States Geologic Survey (USGS) paper entitled *Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan* dated October 2004 (Appendix D), chloride occurs naturally in some sedimentary rock layers (particularly shale; as is the case at the subject site). The chloride is commonly associated with seawater (or saline water) present at the time the rocks formed. Based on this information, the chloride which was detected above NCGPSs at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-7 and MW-8 appears to be the result of naturally occurring conditions. In addition, the TDS

detected above NCGPSs at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8 appears to be the result of naturally occurring conditions and/or turbidity, since elevated natural chloride levels would be expected to contribute to elevated TDS, as well as turbidity.

The pH levels detected below NCGPSs in groundwater samples at BG-1 (6.44 pH) and MW-4 (6.35 pH) appear to be the result of naturally occurring conditions, since they are similar to pH's encountered in groundwater samples at other on-site wells (6.67 pH at MW-1, 6.61 pH at MW-6 and 6.85 pH at MW-7).

The metals detected above NCGPSs at BG-1 (vanadium), MW-4 (cobalt and vanadium) and MW-8 (barium) appear to be the result of turbidity and/or naturally occurring conditions at the site. Naturally occurring metals above NCGPSs are common in North Carolina.

The bromodichloromethane and dibromochloromethane, which were detected above NCGPSs at monitor wells MW-2, MW-3 and MW-7, are common trihalomethanes associated with a reaction between organics and inorganics in naturally occurring water and chlorinated municipal water sources, according to *Basic Information about Disinfection Byproducts in Drinking Water: Total Trihalomethanes, Haloacetic Acids, Bromate, and Chlorite* downloaded from the EPA website (Appendix E). The remaining list of trihalomethanes commonly associated with chlorinated municipal water (cited in the EPA paper) also includes bromoform and chloroform, which were detected below NCGPSs at monitor wells MW-2, MW-3 and MW-7. On July 6, 2015, Buxton Environmental, Inc. conducted the development of monitor wells MW-2, MW-3 and MW-7 and introduced an additional approximately 5-gallons of municipal tap water obtained from a Charlotte-Mecklenburg Utility Department (CMUD) source, in order to enhance development of these slow recharging wells. On September 10, 2015, Buxton Environmental, Inc. conducted additional development of monitor wells MW-2, MW-3 and MW-7. On October 26, 2015, Mr. Ross Klingman, P.G. of Buxton Environmental, Inc. contacted the CMUD - Vest Water Treatment Plant Control Room (704-336-2100), in order to determine their disinfection process. A CMUD employee indicated that the municipal water is disinfected with chlorine gas. Based on this information, the bromodichloromethane and dibromochloromethane detected above NCGPSs in groundwater samples collected at MW-2, MW-3 and MW-7 appear to be the result of municipal water utilized during previous development activities. These trihalomethanes are anticipated to dissipate over time.

Surface Water Analytical Results

Surface water samples SW-1 and SW-2 did not indicate the presence of target constituents above established North Carolina Surface Water and Wetland Standards (15A NCAC 02B) (Gulf Creek and Shaddox Creek are Class WS-IV waters) or EPA National Criteria standards (utilized by North Carolina Division of Water Quality as default standards for non listed parameters) (NCSWWSs).

Quality Control Analytical Results

The equipment blank indicated the presence of 1.2J µg/l acetone, 880B µg/l calcium, 0.38J µg/l antimony, 0.37J µg/l arsenic, 1.0J µg/l barium, 0.489J picocuries per liter (pCi/l) radium 226, 1.13U pCi/l Radium 228, 0.94BJ µg/l Copper and 4.4J µg/l Zinc. A J-flag indicates an estimated result (< Practical Quantitation Limit (PQL) or Report Limit (RL) and >=Method Detection Limit (MDL) or Method Detection Concentration (MDC)). A U-flag indicates that the constituent was detected below the MDC.

The trip blank did not indicate VOC's above method detection limits.

5.0 CONCULSIONS

On August 12 & 13, 2015, Buxton Environmental, Inc. conducted the initial background groundwater and surface water monitoring event at the Brickhaven No. 2 Mine Tract "A" Structural Fill Site located at 1271 Moncure-Flatwood Road in Moncure, Chatham County, North Carolina (Permit No.: 1910-STRUCT-2015). According to the *Permit to Construct/Permit to Operate*- Attachment 3-Conditions of Construction-Line Number 7, a minimum of one (1) independent background sample (of a total of eight (8) independent background sampling events) is required to be collected from each compliance groundwater monitoring well and surface water sampling location, prior to the placement of coal combustion residuals at the site. A summary of the findings of this investigation is provided below.

- A potentiometric groundwater contour map was not generated during this investigation, since water levels at several monitor well locations (namely MW-1, MW-2 and MW-7) do not appear to have fully stabilized following installation and/or development activities. This will be included in subsequent reports.

- Groundwater samples collected at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8 reported the presence of target constituents above established NCGPSs. Groundwater sample MW-5 did not indicate target constituents above established NCGPSs.

- The chloride, which was detected above NCGPSs at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-7 and MW-8, appears to be the result of naturally occurring conditions.

- TDS detected above NCGPSs at monitor wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-8 also appear to be the result of naturally occurring conditions and/or turbidity.

- The pH levels detected below NCGPSs at BG-1 and MW-4 appear to be the result of naturally occurring conditions at the site.

- The metals detected above NCGPSs at BG-1 (vanadium), MW-4 (cobalt and vanadium) and MW-8 (barium) appear to be the result of turbidity and/or naturally occurring conditions at the site.

- The bromodichloromethane and dibromochloromethane detected above NCGPSs at monitor wells MW-2, MW-3 and MW-7 appear to be the result of a reaction of chlorinated municipal water utilized during development of these slow recharging wells and natural groundwater. These constituents are anticipated to dissipate with time.

- Surface water samples SW-1 and SW-2 did not indicate the presence of target constituents above established NCSWWSs.

6.0 RECOMMENDATIONS

Based on the findings of this assessment, Buxton Environmental, Inc. makes the following recommendations.

- Background groundwater and surface water sampling should continue to be conducted on an approximate 45-day frequency until all eight (8) independent background sampling events have been completed. Buxton Environmental, Inc. understands that the second (2nd) of eight (8) background sampling events was conducted at the site from October 15-19, 2015, which was also conducted prior to placement of coal combustion residuals at the site.

- A copy of this report should be forwarded by HDR to the NCSWS for their review.

7.0 RERFERENCES

Buxton Environmental, Inc., *Design Hydrogeologic Report – Addendum, Revision 2*, for the Brickhaven Mine, March 6, 2015.

Buxton Environmental, Inc., *Water Quality Monitoring Plan*, for the Brickhaven Mine was submitted to NCSWS as a stand-alone document by HDR on March 23, 2015.

Buxton Environmental, Inc., *Compliance Groundwater Monitor Well Installation, Development, Surveying & Hydraulic Conductivity Determination Activities*, Brickhaven No.2 Mine Tract "A" Structural Fill Site, October 2, 2015.

North Carolina Department of Natural Resources and Community Development, 1985, *North Carolina Geologic Map.*

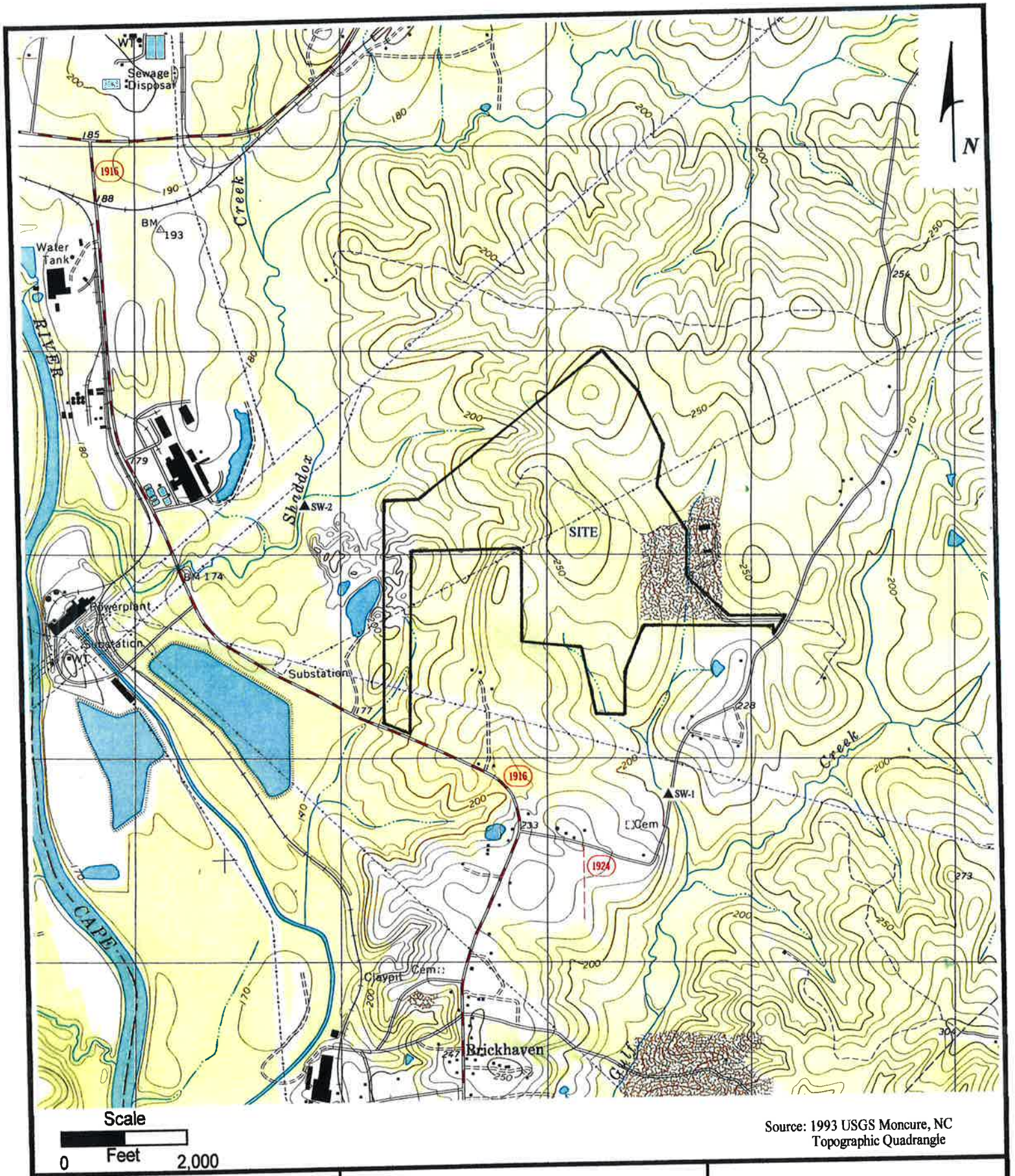
North Carolina Solid Waste Section, *Guidelines for Groundwater, Soil, and Surface Water Sampling*, Rev. April 2008.

U.S. EPA, *Basic Information about Disinfection Byproducts in Drinking Water: Total Trihalomethanes, Haloacetic Acids, Bromate, and Chlorite*, EPA website, downloaded September 2015.

U.S. EPA Region I, *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells* (EPA Low Flow Sampling Procedure) originally dated July 30, 1996 and revised on January 19, 2010 (Revision 3).

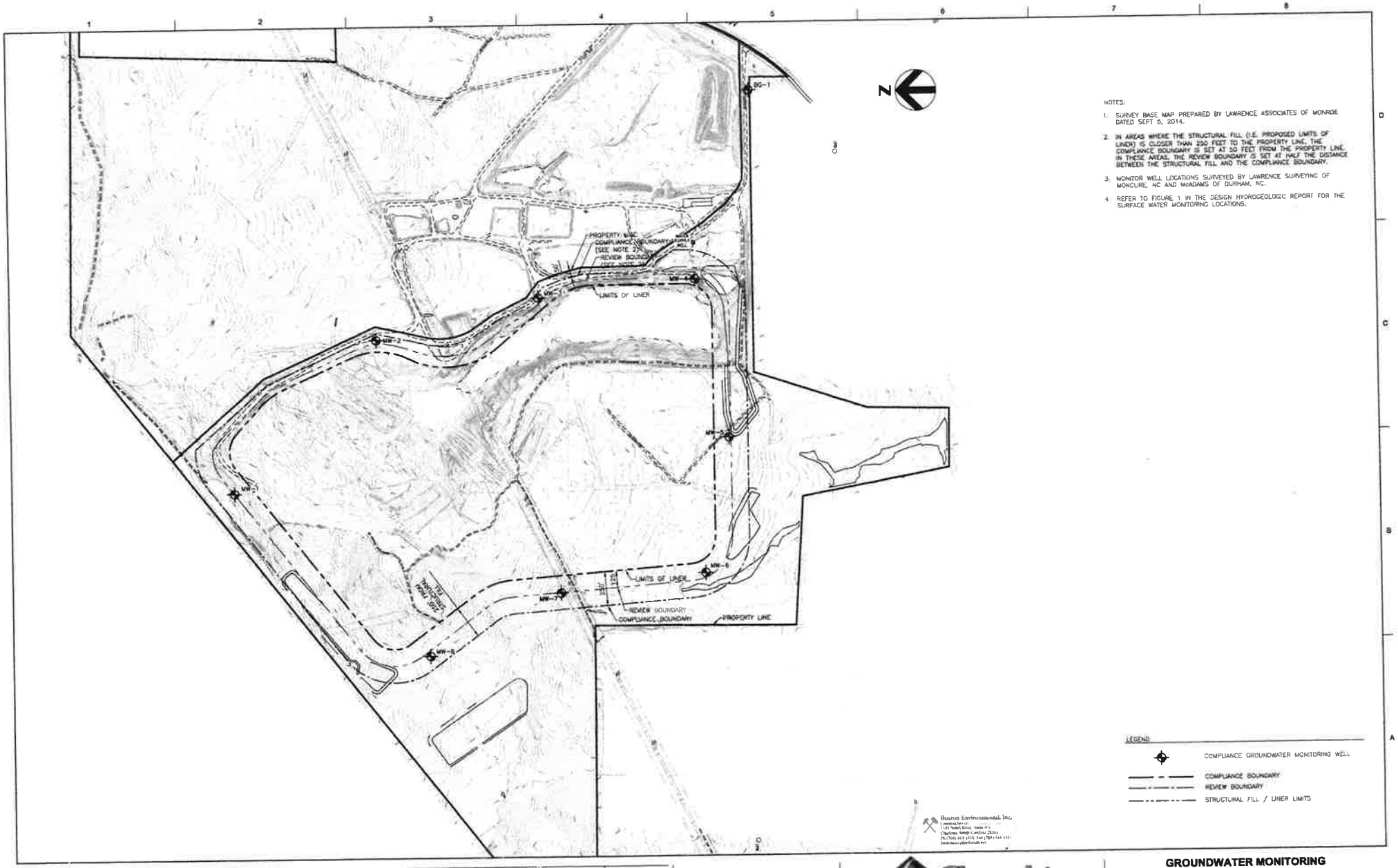
Unites States Geological Survey (USGS), *Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan*, USGS website, downloaded September 2015.

FIGURES



Source: 1993 USGS Moncure, NC Topographic Quadrangle

Brickhaven No. 2 Mine Tract "A" 1271 Moncure-Flatwood Road Moncure, North Carolina	Buxton Environmental, Inc.	Figure 1. Site Location Map



NOTES:

1. SURVEY BASE MAP PREPARED BY LAWRENCE ASSOCIATES OF MONROE DATED SEPT 5, 2014.
2. IN AREAS WHERE THE STRUCTURAL FILL (I.E. PROPOSED LIMITS OF LINER) IS CLOSER THAN 250 FEET TO THE PROPERTY LINE, THE COMPLIANCE BOUNDARY IS SET AT 50 FEET FROM THE PROPERTY LINE. IN THESE AREAS, THE REVIEW BOUNDARY IS SET AT HALF THE DISTANCE BETWEEN THE STRUCTURAL FILL AND THE COMPLIANCE BOUNDARY.
3. MONITOR WELL LOCATIONS SURVEYED BY LAWRENCE SURVEYING OF MONCURE, NC AND McADAMS OF DURHAM, NC.
4. REFER TO FIGURE 1 IN THE DESIGN HYDROGEOLOGIC REPORT FOR THE SURFACE WATER MONITORING LOCATIONS.

LEGEND

- COMPLIANCE GROUNDWATER MONITORING WELL
- COMPLIANCE BOUNDARY
- REVIEW BOUNDARY
- STRUCTURAL FILL / LINER LIMITS

Beacon Environmental Inc.

HDR

HDR Engineering Inc. of the Carolinas
440 S. Church St. Suite 1000
Charlotte, NC 28202-2075
704.338.8700

ISSUE	DATE	DESCRIPTION
C	7/21/15	ISSUED FOR CCR COMPLIANCE

PROJECT MANAGER	M.D. PLUMMER, P.E.
DESIGNED BY	R. KLINGMAN, P.G.
DRAWN BY	J. GAUL
CHECKED BY	
PROJECT NUMBER	453925-237673-018

NORTH CAROLINA LICENSED SEAL 1986 GEOLOGIST CHARLES ROSS KLINGMAN

Charah

BRICKHAVEN No. 2 MINE TRACT "A" MINE
STRUCTURAL FILL
MONCURE, NC

GROUNDWATER MONITORING SYSTEM MAP

0 1" 2"

FILENAME 01G-14.dwg
SCALE 1"=300

SHEET
FIGURE 2

TABLES

TABLE 1
COMPLIANCE MONITOR WELL DETAILS, HYDRAULIC CONDUCTIVITY AND GROUNDWATER GAUGING INFORMATION
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA
AUGUST 12, 2015

Well ID	*Northing*	*Easting*	*Pad Elev. (ft)*	*TOC Elev. (ft)*	*TD BGS (ft)*	*TD BTOC (ft)*	*Screen Length (ft)*	*Screen Interval (ft)*	*Lithologic Unit*	*Hydraulic Conductivity (cm/sec)*	*DTW BTOC (ft)*	*DTW Elevation (ft)*
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	Layered Rock/PWR*	7.761×10^{-5}	11.88	216.31
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	Layered Rock/PWR*	4.105×10^{-4}	60.04	220.04
MW-2	673677.07	1994537.54	227.45	229.97	45.00	47.52	15	197.45 - 182.45	Layered Rock/PWR*	3.405×10^{-6}	38.19	191.78
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	PWR	4.076×10^{-7}	14.94	207.62
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	Residuum/PWR	1.413×10^{-4}	11.60	205.53
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	PWR	8.010×10^{-6}	12.85	232.01
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	216.63 - 201.63	Residuum/PWR	1.097×10^{-4}	7.79	223.31
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	Residuum/PWR	1.264×10^{-6}	8.26	223.45
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	PWR	1.289×10^{-4}	36.49	199.98

Notes:

Depth to water measurements obtained on August 12, 2015 to the nearest 0.01 foot with a depth to water meter by Buxton Environmental, Inc.

Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.

Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.

TD=total depth;BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing

Hydraulic conductivity values determined by Buxton Environmental, Inc. on September 10, 2015 by conduting rising head slug tests; and solved utilizing the Bouwer-Rice (unconfined slug test) solution with AQTESOLV for Windows Version 4.50 software by Hydrosolv, Inc. (1996-2007).

* = interpreted lithologic unit based on relative drilling hardness during well installation

TABLE 2
INITIAL BACKGROUND GROUNDWATER, SURFACE WATER AND QUALITY CONTROL ANALYTICAL RESULTS - AUGUST 12 & 13, 2015
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

		Groundwater											***Surface Water***			***Quality Control***	
Sample ID	***SWSL***	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	SW-1	SW-2	***NCSWWS***	Equip. Blank	Trip Blank
EPA APPENDIX III (40 CRF 257.94(b))																	
Boron (µg/l)	NE	8.5J	6.9J	36	34	8.1J	11J	8.1J	98	9.9J	700	--	9.4J	87	NS	1.2J	NT
Calcium (µg/l)	NE	32,000B	150,000B	97,000B	150,000B	44,000B	17,000B	38,000B	37,000B	110,000B	NS	NS	4,200B	12,000B	NS	880B	NT
Chloride (µg/l)	NS	**270,000**	**570,000**	**790,000**	**990,000**	**320,000**	22,000	230,000	**430,000**	**470,000**	250,000	--	8,000	20,000	250,000	BDL	NT
Fluoride (µg/l)	2,000	220J	230J	BDL	BDL	510	740	490J	450J	BDL	2,000	--	90J	290	1,800	BDL	NT
pH* (standard units)	NE	**6.44**	6.67	7.89	7.41	**6.35**	7.27	6.61	6.85	7.20	6.5-8.5	--	7.14	6.86	6.0-9.0	NT	NT
Sulfate (µg/l)	######	23,000	22,000	79,000	24,000J	11,000	4,100	48,000	36,000	6,300	250,000	--	890J	2,200	250,000	BDL	NT
Total Dissolved Solids (µg/l)	######	**690,000B**	**1,500,000**	**1,700,000**	**2,100,000**	**820,000**	230,000	**680,000B**	**1,100,000B**	**1,300,000B**	500,000	--	53,000B	180,000B	500,000	BDL	NT
EPA APPENDIX IV (40 CFR 257.94(b))																	
Antimony (µg/l)	6	0.55J	0.23J	0.49J	0.31J	BDL	0.58J	0.53J	0.63J	0.68J	1	--	0.48J	0.62J	5.6	0.38J	NT
Arsenic (µg/l)	10	2.2	2.8	3.2	6.7	2.0	0.75J	1.2	2.1	3.2	10	--	1.1	2.9	10	0.37J	NT
Barium (ug/l)	100	380	220	260	670	390	160	100	290	**1,100**	700	--	49	110	1,000	1.0J	NT
Beryllium (µg/l)	1	0.12J	BDL	0.17J	BDL	0.19J	BDL	BDL	BDL	BDL	4	--	BDL	BDL	6.5	BDL	NT
Cadmium (µg/l)	1	0.061J	0.13	0.060J	BDL	0.057J	BDL	BDL	0.18	0.071J	2	--	0.050J	BDL	2	BDL	NT
Chromium (µg/l)	10	BDL	0.92J	5.2	1.1J	2.5J	1.8J	0.7J	0.84J	1.7J	10	--	BDL	BDL	50	BDL	NT
Cobalt (µg/l)	10	0.88J	0.35J	1.6J	0.64J	**7.6**	1.5J	2.2J	1.2J	0.34J	1	--	1.3J	1.4J	3	BDL	NT
Fluoride (µg/l)	2,000	220J	230J	BDL	BDL	510	740	490J	450J	BDL	2,000	--	90J	290	1,800	BDL	NT
Lead (µg/l)	10	1.3	0.34J	2.0	0.27J	2.8	1.2	0.45J	0.20J	0.53J	15	--	0.38J	1.2	25	BDL	NT
Lithium (µg/l)	NE	18.5	32.0	22.4	19.3	22.6	7.18J	28.1	21.1	27.6	NS	NS	BDL	BDL	NS	BDL	NT
Mercury (µg/l)	0.2	0.075J	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1	--	BDL	BDL	0.012	BDL	NT
Molybdenum (µg/l)	NE	0.55J	0.95J	11	19	1.6J	1.5J	1.4J	3.6J	BDL	NS	NS	1.0J	BDL	160	BDL	NT
Selenium (µg/l)	10	4.5	8.1	7.7	15	5.9	1.0	4.3	8.4	6.6	20	--	BDL	1.6	5	BDL	NT
Thallium (µg/l)	5.5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.28	--	BDL	BDL	0.24	BDL	NT
Radium 226 (pCi/l)	NE	0.802J	0.709J	1.33	0.990J	0.814J	0.564J	0.806J	0.423J	0.920J	NS	5 (combined)	0.521J	0.363J	NS	0.489J	NT
Radium 228 (pCi/l)	NE	0.496U	0.538U	1.39U	2.03J	1.52U	0.520U	1.26U	0.271U	-0.831U	NS		0.426U	0.468U	NS	1.13U	NT
EPA APPENDIX I METALS (Additional) (40 CFR 258)																	
Copper (µg/l)	10	1.4B	0.87BJ	4.1B	1.6B	5.3B	3.2B	1.1B	1.3B	1.5B	1,000	--	1.2B	1.5B	7	0.94BJ	NT
Nickel (µg/l)	50	1.3J	2.5J	5.4	3.5J	8.2	3.0J	2.6J	4.3J	2.4J	100	--	1.5J	1.8J	88	BDL	NT
Silver (µg/l)	10	BDL	0.50J	BDL	BDL	BDL	BDL	BDL	BDL	1.6	20	--	BDL	BDL	0.06	BDL	NT
Vanadium (µg/l)	25	**6.0**	2.7J	4.8J	2.5J	**5.9**	3.8J	1.6J	1.5J	2.5J	0.3	--	BDL	3.7J	NS	BDL	NT
Zinc (µg/l)	10	8.3J	6.3J	12	5.1J	31	16	5.8J	4.0J	5.1J	1,000	--	28	7.0J	50	4.4J	NT
EPA APPENDIX I VOC'S (40 CFR 258)																	
Acetone (µg/l)	100	BDL	BDL	1.6J	1.8J	BDL	BDL	1.6J	BDL	BDL	6,000	--	3.6J	7.3J	2,000	BDL	BDL
Bromodichloromethane (µg/l)	1	BDL	BDL	**4.0**	**1.7**	BDL	BDL	BDL	**3.5**	BDL	0.6	80 (all THM's)	BDL	BDL	NS	BDL	BDL
Bromoform (µg/l)	3	BDL	BDL	1.4	1.0	BDL	BDL	BDL	1.1	BDL	4		BDL	BDL	4.3	BDL	BDL
Chloroform (µg/l)	5	BDL	0.71J	4.5	1.2	BDL	BDL	BDL	2.0	BDL	70		BDL	BDL	5.6	BDL	BDL
Dibromochloromethane (µg/l)	3	BDL	BDL	**3.7**	**2.6**	BDL	BDL	BDL	**4.4**	BDL	0.4		BDL	BDL	NS	BDL	BDL
Carbon Disulfide (µg/l)	100	BDL	BDL	0.54J	BDL	0.53J	0.93J	0.52J	0.51	0.54J	700	--	BDL	BDL	NS	BDL	BDL
Dibromomethane (µg/l)	10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.31J	BDL	70	--	BDL	BDL	47	BDL	BDL
1,4-Dichlorobenzene (µg/l)	1	BDL	0.19J	BDL	BDL	BDL	BDL	BDL	BDL	BDL	6	--	BDL	BDL	63	BDL	BDL

Notes:
Groundwater and surface water samples collected on August 12 & 13, 2015 and analyzed for above parameters by Shealy Environmental Servcies, Inc. and their subcontractor GEL Laboratories LLC (Lithium and Radium)
BDL = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
SWSL - North Carolina, Solid Waste Section Limit (minimum detection limit)
NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
Bold and shade denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
U = analyte was analyzed for, but not detected above the method detection concentration (MDC)
* = pH was field tested by Buxton Environmental, Inc. with a Horiba U-52, which was calibrated by and rented from Enviro-Equipment, Inc. of Pineville, NC.

APPENDIX A
WELL PURGING – FIELD QUALITY MEASUREMENT FORMS

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BEECHHAWK NO. 2 MINE
Well Number BG-1 Date 8-12-15 22:10
Field Personnel ROSS KLINGMAN w/ BURTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 28.05 / 43.05 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 39'
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ POLY TUBING
Total Volume Purged 15.5 gal 3 W.BV = 15.5 gal

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ mS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
						HORIBA U-52 METER				MICRO-TPW	
21.10	STATIC 11.88										
21:20		8.6v									START PUMP
21:28	22.50	8.6v	0.56 g/min	4.5 gal	17.12	1.25	7.00	170	4.96	101.3	
21:35	23.30	8.6v	0.37 g/min	5.5 gal	16.69	1.25	6.60	181	mF	66.1	
21:42	25.82	9.9v	0.41 g/min	8 gal	16.40	1.22	6.51	186	mF	111.8	
21:50	29.84	9.9v	0.35 g/min	10.5 gal	16.39	1.21	6.51	191	mF	35.97	
22:00	29.20	9.9v	0.33 g/min	13 gal	16.32	1.20	6.50	191	mF	35.77	
22:10	29.55	9.9v	0.30 g/min	15 gal	16.30	1.20	6.44	191	mF	37.62	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON: PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number MW-1 Date 8-12-15 11:15
Field Personnel ROSS KLINGMAN w/ BRYTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to (below MP) top 60.30 bottom 75.30 of screen
Pump Intake at (ft. below MP) 70
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS)
Total Volume Purged 12 GAL

- POLYETHYLENE TUBING
- PROACTIVE 12V CONTROLLER
- 3 WELL BORE VOLUMES (WBV) = 7.6 GAL

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ~~ml/min~~ gal/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ mS/cm	pH	ORP[3] mv	DO mg/L	Turbidity NTU	Comments
						HORIBA U-52 METER				MICRO-TPW	
10:24	STATIC 60.04'										
10:35	60.00'	15.5V									START PUMP
10:45	60.00	15.4V	0.5 g/min	5 GAL	22.42	1.69	7.34	133	12.71	86.8	
10:55	61.05	15.4V	0.35 g/min	7 GAL	20.23	2.00	6.88	122	MF –	56.3	
11:07	61.15	15.4V	0.31 g/min	10 GAL	18.79	2.14	6.70	128	MF –	23.3	
11:15	61.24	15.4V	0.3 g/min	12 GAL	18.07	2.16	6.67	112	MF –	10.0	SAMPLE
									MF = MALFUNCTION	?	
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON: PUMP + DTW METER

TAP H2O RINSE – ALCONOX WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BEICHHALED NO. 2 MINE
Well Number MW-2 Date 8-12-15 12:40
Field Personnel ROSS KLINGMAN w/ BURTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 32.52 / 47.52 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 47
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ POLY TUBING
Total Volume Purged 3.5 gal 3 WBV = 4.7 gal

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ ms/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
					HORIBA U-52 METER				MICRO-TPW		
12:15	STATIC 38.19										
12:25		12.1									START PUMP
12:35	44.20	12.0	0.25	2.5 gal	21.62	1.79	8.0	108	2.51	13.16	GOING DRY
12:40	46.75	12.0	0.23	3.5 gal	20.50	1.80	7.89	105	MF	12.74	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON: PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number MW-3 Date 8-12-15 14:10
Field Personnel ROSS KLINGMAN w/ BUXTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 28.36 / 43.36 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 38'
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ POLY TUBING
Total Volume Purged 3.5 gal 3 WBV = 14.21 gal

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ ms/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
					HORIBA W-52 METER				MICROTPW		
13:40	STATIC 14.94										
13:48		8.9v									START PUMP
13:52	22.65	9.7v	0.38 g/min	1.5 gal	20.48	3.37	7.51	139	6.04	8.41	
14:02	26.10	9.9v	0.14 g/min	2 gal	20.92	3.06	7.42	144	3.82	9.61	
14:08	29.51	10.5v	0.15 g/min	3 gal	19.36	2.96	7.41	148	3.88	6.96	GOING DRY
14:10	35.50	11.4v	0.16 g/min	3.5 gal	19.48	2.88	7.41	150	3.87	7.10	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO 2 MINE
Well Number MW-4 Date 8-12-15 15:20
Field Personnel ROSS KLINGMAN w/ BUXTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 15.34 / 25.34 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 22'
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ POLY TUBING
Total Volume Purged 7 GAL 3 WBV = 6.9 GAL

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/MIN	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ ms/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
					HORIBA W-52 METER				MICRO-TPW		
14:50	STATIC 11.60										
15:00	15:20										START PUMP
15:05	15.90		0.2 g/min	1 GAL	19.54	1.61	6.75	-58	3.08	254.8	
15:10	15.90		0.25 g/min	2.5 GAL	19.61	1.59	6.51	-35	MF	295.0	
15:15	15.92		0.37 g/min	5.5 GAL	19.37	1.65	6.34	-14	MF	255.1	
15:20	17.50		0.35 g/min	7 GAL	19.07	1.62	6.35	-3	MF	196	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number MW-5 Date 8-12-15 16:25
Field Personnel ROSS KLINGMAN w/ BUXTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 36.14 / 46.14 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 41'
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ POLY TUBING
Total Volume Purged 5.5 GAL 3 WBV = 16.6

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/MIN	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ ms/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
					HORIBA W-52 METER				MICRO-TPW		
16:00	STATIC 12.85										
16:08		9.2V									START PUMP
16:15	21.40	10.4V	0.29 g/min	2 GAL	17.34	0.499	7.40	193	4.53	45.07	
16:19	27.00	10.2V	0.23 g/min	2.5 GAL	17.89	0.499	7.31	200	MF	21.57	
16:22	30.18	10.8V	0.29 g/min	4 GAL	17.99	0.498	7.23	208	MF	20.29	GOING DRY
16:25	32.10	10.8V	0.32 g/min	5.5 GAL	17.98	0.498	7.27	205	MF	20.10	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BEECHHAVEN NO. 2 MINE
Well Number MW-6 Date 8-12-15 18:30
Field Personnel Ross KLINGMAN w/ BURTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 14.47 / 29.47 of screen (1.8" Dia.)
(below MP) top bottom
Pump Intake at (ft. below MP) 20' COULD NOT LOWER PUMP BELOW 21' DUE TO X-THREADS ?
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ Poly Tubing
Total Volume Purged 11.5 GAL 3 WBV = 10.8 GAL

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/min	Cum. Volume Purged liters	Temp. °C (1)	Spec. Cond.[2] ~~µS/cm~~ ms/cm (HORIBA U-52)	pH	ORP[3] mv (2 METER)	DO mg/L (1)	Turb-idity NTU (MICRO-TPW)	Comments
17:10	STATIC 7.79										
17:25		5.8v									START PUMP
17:28	10.55	6.5v	0.33 g/min	1.0 GAL	20.66	1.51	7.25	138	6.43	733	
17:39	13.70	7.8v	0.18 g/min	2.5 GAL	18.18	1.32	6.78	34	mf	235	
17:45	12.90	7.8v	0.23 g/min	4.5 GAL	18.75	1.21	6.58	39	mf	61.5	
17:55	13.27	8.0v	0.20 g/min	6 GAL	18.25	1.18	6.51	38	mf	59.24	
18:05	13.40	8.0v	0.19 g/min	7.5 GAL	18.14	1.15	6.50	36	mf	51.5	
18:30	14.15	8.0v	0.18 g/min	11.5 GAL	17.80	1.28	6.61	23	mf	26.59	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON: PUMP + DTW METER

TAP H2O RINSE — ALCONOX TAP H2O WASH — TAP H2O RINSE — DISTILLED H2O RINSE

— PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number MW-7 Date 8-12-15 19:30
Field Personnel ROSS KLINGMAN w/ BUXTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to (below MP) 7.18 / 17.18 of screen
top bottom
Pump Intake at (ft. below MP) 15'
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ POLY TUBING
Total Volume Purged 4.5 GAL 3 WBV = 4.5 GAL

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/MIN	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ ms/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
					HORIBA W-52 METER				MICRO-TPW		
19:00	STATIC 8.26										
19:08		6.1v									START PUMP
19:12	9.10	6.4v	0.13 g/min	0.5 GAL	19.99	2.0	6.79	124	8.45	31.78	
19:17	10.69	6.6v	0.17 g/min	1.5 GAL	20.83	2.06	6.69	134	5.73	12.90	
19:30	13.72	6.6v	0.20 g/min	4.5 GAL	19.41	1.86	6.85	85	5.30	9.90	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BEICHHAUEN NO. 2 MINE
Well Number MW-8 Date 8-12-15 20:40
Field Personnel ROSS KLINGMAN w/ BURTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP TOP-OF-CASING

Depth to 34.06 / 49.06 of screen
(below MP) top bottom
Pump Intake at (ft. below MP) 45'
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS) w/ Poly Tubing
Total Volume Purged 7.5 GAL 3 W.BV = 12.57 GAL

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min g/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] ~~µS/cm~~ ms/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
					1	HORIBA U-5		2 METER	1	MICRO-TPW	
19:55	STATIC 36.49										
20:03		10.7v									START
20:08	37.70	10.7v		1.5 GAL	18.11	3.18	7.40	144	5.72	55.08	
20:20	38.60	10.8v		4 GAL	16.87	2.27	7.13	123	mF	28.77	
20:25	38.82	10.9v		5 GAL	16.83	1.97	7.15	111	mF	27.35	
20:40	39.50	11.0v		7.5 GAL	16.68	1.83	7.20	100	mF	15.35	SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

DECON: PUMP + DTW METER

TAP H2O RINSE – ALCONOX TAP H2O WASH – TAP H2O RINSE – DISTILLED H2O RINSE

– PLASTIC SHEET PLACED @ WELL HEAD

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number SW-1 Date 8-13-15 7:45
Field Personnel Ross KLINGMAN w/ BUXTON ENVIRONMENTAL
Sampling Organization BEI
Identify MP

Depth to ____/____ of screen
(below MP) top bottom
Pump Intake at (ft. below MP)
Purging Device; (pump type)
Total Volume Purged

0.3" TRAIN 8-11-15
- SURFACE H2O APPEARS TO BE BASE FLOW
- LOW FLOW

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	HORIBA Spec. Cond.[2] µS/cm	U-52 METER pH	ORP[3] mv	DO mg/L	MICRO-TPW Turb-idity NTU	Comments
7:45					20.20	0.106	7.14	226	8.11	14.68	GRAB SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number SW-2 Date 8-13-15 8:30
Field Personnel ROSS KINGMAN w/ BURTON ENVIRONMENTAL
Sampling Organization
Identify MP

Depth to / of screen
(below MP) top bottom
Pump Intake at (ft. below MP)
Purging Device; (pump type)
Total Volume Purged

0.31" RAIN 8-11-15
- SURFACE H2O APPEARS TO BE BASEFLOW IN SHADDOX CREEK - LOW FLOW
- NO FLOW FROM INTERMITTENT CREEK FROM SITE

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
						HORIBA	U-52	METER		MICRO-TPW	
8:30					22.33	0.289	6.86	205	4.51	55.35	QTAS SAMPLE
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

APPENDIX C
EXAMPLE (Minimum Requirements)
WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) BRICKHAVEN NO. 2 MINE
Well Number EQUIPMENT BLANK Date 8-12-15 9:30
Field Personnel ROSS KLINGMAN of BATON ENVIRONMENTAL
Sampling Organization BEI
Identify MP

Depth to ____/____ of screen
(below MP) top bottom
Pump Intake at (ft. below MP) ____
Purging Device; (pump type) PROACTIVE SS MONSOON (STAINLESS)
Total Volume Purged ____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
9:30											COLLECTED @ MW-1
											- POUR LAB DI H2O
											THROUGH PUMP INTO
											BOTTLES
											- WEARING NITRILE GLOVES
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

APPENDIX C

EXAMPLE (Minimum Requirements)

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)_____

Well Number_____ Date_____

Field Personnel_____

Sampling Organization_____

Identify MP_____

Depth to _____/_____ of screen
(below MP) top bottom

Pump Intake at (ft. below MP)_____

Purging Device; (pump type)_____

Total Volume Purged _____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. °C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Turb-idity NTU	Comments
Stabilization Criteria					3%	3%	±0.1	± 10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

APPENDIX B
FIELD PARAMETER INSTRUMENT CALIBRATION DATA SHEETS

ENVIRO-EQUIPMENT, INC.

H.F. SCIENTIFIC MicroTPI/TPW CALIBRATION DATA SHEET

Serial Number: 2015052061 **Date:** 7-31-15 **Inspector:** CSF

Calibration Check (Performed At Lab Room Temperature)

Solution/Values	*Lot Number*	*Expiration*	*Instrument Reading*	*Accuracy*
1,000 NTU	50503	05/2017	1003 NTU	±3 %
100 NTU	—	—	—	±2 %
10.0 NTU	50539	05/2017	9.99 NTU	±2 %
0.02 NTU	50501	05/2017	0.02 NTU	±0.01 NTU

Note all standard solution values are at 25° C.
Some models of the MicroTPI/TPW only require a three point calibration

ENVIRO-EQUIPMENT, INC.

HORIBA U-52 CALIBRATION DATA SHEET

Serial Number: 5G85ADCT **Date:** 8-6-15 **Inspector:** CSF

Calibration Check (Performed At Lab Room Temperature)

Zero Calibration

Conductivity Zero Completed: Done **Reading:** 0.000 mS/cm
Performed in open air.

Turbidity Zero Completed: Done **Reading:** 0.0 NTU
Performed in distilled water.

Span Calibration

Solution/Value	*Manufacturer*	*Lot Number*	*Expiration*	*Reading*	*Accuracy*
pH 7.00	AquaPhoenix	4AI5K	Sep/16	7.16	±0.1
pH 10.00	AquaPhoenix	5AA164	Jan/17	10.03	±0.1
Conductivity 1.00 mS/cm	AquaPhoenix	5GG292	Jul./16	1.00 mS/cm	±1%
Turbidity 100 NTU	Horiba	**N/A**	**N/A**	101 NTU	±5%

Dissolved Oxygen Calibration

Calibration Type	*Temperature*	*Expected Reading*	*Reading*	*Accuracy*
Zero	N/A	0.00 mg/L	0.0 mg/L	± 0.2 mg/L
O_2 Saturated H_2O	21.7 °C	8.53 mg/L	8.47 mg/L	± 0.2 mg/L

Temperature Check **Testo 925 (NIST Traceable)** 21.0 °C ±0.5 °C
Horiba U-52 21.1 °C ±1.0 °C

*****Note all standard solution values are at 25°C.*****

Inspector's Maintenance Notes

EEI U-52 CAL FORM 3/24/11

APPENDIX C
LABORATORY DATA SHEETS

SHEALY ENVIRONMENTAL SERVICES, INC.

Report of Analysis

Buxton Environmental
PO Box 11550
Charlotte, NC 28220
Attention: Ross Klingman

Project Name: **Brickhaven No. 2 Mine Tract "A"**

Project Number: **1271 Moncure - Flatwood Rd.**

Lot Number: **QH13039**

Date Completed: **09/09/2015**

Nisreen Saikaly
Project Manager

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The following non-paginated documents are considered part of this report: Chain of Custody Record and Sample Receipt Checklist.

Case Narrative
Buxton Environmental
Lot Number: QH13039

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved NELAC standards, the Shealy Environmental Services, Inc. ("Shealy") Quality Assurance Management Plan (QAMP), standard operating procedures (SOPs), and Shealy policies. Any exceptions to the NELAC standards, the QAMP, SOPs or policies are qualified on the results page or discussed below.

If you have any questions regarding this report please contact the Shealy Project Manager listed on the cover page.

Sample Summary
Buxton Environmental
Lot Number: QH13039

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	MW-1	Aqueous	08/12/2015 1115	08/13/2015
002	MW-2	Aqueous	08/12/2015 1240	08/13/2015
003	MW-3	Aqueous	08/12/2015 1410	08/13/2015
004	MW-4	Aqueous	08/12/2015 1520	08/13/2015
005	MW-5	Aqueous	08/12/2015 1625	08/13/2015
006	MW-6	Aqueous	08/12/2015 1830	08/13/2015
007	MW-7	Aqueous	08/12/2015 1930	08/13/2015
008	MW-8	Aqueous	08/12/2015 2040	08/13/2015
009	BG-1	Aqueous	08/12/2015 2210	08/13/2015
010	SW-1	Aqueous	08/13/2015 0745	08/13/2015
011	SW-2	Aqueous	08/13/2015 0830	08/13/2015
012	EQUIPMENT BLANK	Aqueous	08/12/2015 0930	08/13/2015
013	TRIP BLANK(SH1412)	Aqueous	08/12/2015	08/13/2015
014	TRIP BLANK(SH2271)	Aqueous	08/12/2015	08/13/2015

(14 samples)

Executive Summary
Buxton Environmental
Lot Number: QH13039

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	MW-1	Aqueous	Chloride	300.0	570		mg/L	9
001	MW-1	Aqueous	Fluoride	300.0	0.23	J	mg/L	9
001	MW-1	Aqueous	Sulfate	300.0	22		mg/L	9
001	MW-1	Aqueous	TDS	SM 2540C-	1500		mg/L	9
001	MW-1	Aqueous	Chloroform	8260B	0.71	J	ug/L	10
001	MW-1	Aqueous	1,4-Dichlorobenzene	8260B	0.19	J	ug/L	10
001	MW-1	Aqueous	Antimony	6020A	0.23	J	ug/L	12
001	MW-1	Aqueous	Arsenic	6020A	2.8		ug/L	12
001	MW-1	Aqueous	Barium	6020A	220		ug/L	12
001	MW-1	Aqueous	Boron	6020A	6.9	J	ug/L	12
001	MW-1	Aqueous	Cadmium	6020A	0.13		ug/L	12
001	MW-1	Aqueous	Calcium	6020A	150000	B	ug/L	12
001	MW-1	Aqueous	Chromium	6020A	0.92	J	ug/L	12
001	MW-1	Aqueous	Cobalt	6020A	0.35	J	ug/L	12
001	MW-1	Aqueous	Copper	6020A	0.87	BJ	ug/L	12
001	MW-1	Aqueous	Lead	6020A	0.34	J	ug/L	12
001	MW-1	Aqueous	Molybdenum	6020A	0.95	J	ug/L	12
001	MW-1	Aqueous	Nickel	6020A	2.5	J	ug/L	12
001	MW-1	Aqueous	Selenium	6020A	8.1		ug/L	12
001	MW-1	Aqueous	Silver	6020A	0.50	J	ug/L	12
001	MW-1	Aqueous	Vanadium	6020A	2.7	J	ug/L	12
001	MW-1	Aqueous	Zinc	6020A	6.3	J	ug/L	12
002	MW-2	Aqueous	Chloride	300.0	790		mg/L	14
002	MW-2	Aqueous	Sulfate	300.0	79		mg/L	14
002	MW-2	Aqueous	TDS	SM 2540C-	1700		mg/L	14
002	MW-2	Aqueous	Acetone	8260B	1.6	J	ug/L	15
002	MW-2	Aqueous	Bromodichloromethane	8260B	4.0		ug/L	15
002	MW-2	Aqueous	Bromoform	8260B	1.4		ug/L	15
002	MW-2	Aqueous	Carbon disulfide	8260B	0.54	J	ug/L	15
002	MW-2	Aqueous	Chloroform	8260B	4.5		ug/L	15
002	MW-2	Aqueous	Dibromochloromethane	8260B	3.7		ug/L	15
002	MW-2	Aqueous	Antimony	6020A	0.49	J	ug/L	17
002	MW-2	Aqueous	Arsenic	6020A	3.2		ug/L	17
002	MW-2	Aqueous	Barium	6020A	260		ug/L	17
002	MW-2	Aqueous	Beryllium	6020A	0.17	J	ug/L	17
002	MW-2	Aqueous	Boron	6020A	36		ug/L	17
002	MW-2	Aqueous	Cadmium	6020A	0.060	J	ug/L	17
002	MW-2	Aqueous	Calcium	6020A	97000	B	ug/L	17
002	MW-2	Aqueous	Chromium	6020A	5.2		ug/L	17
002	MW-2	Aqueous	Cobalt	6020A	1.6	J	ug/L	17
002	MW-2	Aqueous	Copper	6020A	4.1	B	ug/L	17
002	MW-2	Aqueous	Lead	6020A	2.0		ug/L	17
002	MW-2	Aqueous	Molybdenum	6020A	11		ug/L	17
002	MW-2	Aqueous	Nickel	6020A	5.4		ug/L	17
002	MW-2	Aqueous	Selenium	6020A	7.7		ug/L	17

Executive Summary (Continued)

Lot Number: QH13039

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
002	MW-2	Aqueous	Vanadium	6020A	4.8	J	ug/L	17
002	MW-2	Aqueous	Zinc	6020A	12		ug/L	17
003	MW-3	Aqueous	Chloride	300.0	990		mg/L	19
003	MW-3	Aqueous	Sulfate	300.0	24	J	mg/L	19
003	MW-3	Aqueous	TDS	SM 2540C-	2100		mg/L	19
003	MW-3	Aqueous	Acetone	8260B	1.8	J	ug/L	20
003	MW-3	Aqueous	Bromodichloromethane	8260B	1.7		ug/L	20
003	MW-3	Aqueous	Bromoform	8260B	1.0		ug/L	20
003	MW-3	Aqueous	Chloroform	8260B	1.2		ug/L	20
003	MW-3	Aqueous	Dibromochloromethane	8260B	2.6		ug/L	20
003	MW-3	Aqueous	Antimony	6020A	0.31	J	ug/L	22
003	MW-3	Aqueous	Arsenic	6020A	6.7		ug/L	22
003	MW-3	Aqueous	Barium	6020A	670		ug/L	22
003	MW-3	Aqueous	Boron	6020A	34		ug/L	22
003	MW-3	Aqueous	Calcium	6020A	150000	B	ug/L	22
003	MW-3	Aqueous	Chromium	6020A	1.1	J	ug/L	22
003	MW-3	Aqueous	Cobalt	6020A	0.64	J	ug/L	22
003	MW-3	Aqueous	Copper	6020A	1.6	B	ug/L	22
003	MW-3	Aqueous	Lead	6020A	0.27	J	ug/L	22
003	MW-3	Aqueous	Molybdenum	6020A	19		ug/L	22
003	MW-3	Aqueous	Nickel	6020A	3.5	J	ug/L	22
003	MW-3	Aqueous	Selenium	6020A	15		ug/L	22
003	MW-3	Aqueous	Vanadium	6020A	2.5	J	ug/L	22
003	MW-3	Aqueous	Zinc	6020A	5.1	J	ug/L	22
004	MW-4	Aqueous	Chloride	300.0	320		mg/L	24
004	MW-4	Aqueous	Fluoride	300.0	0.51		mg/L	24
004	MW-4	Aqueous	Sulfate	300.0	11		mg/L	24
004	MW-4	Aqueous	TDS	SM 2540C-	820		mg/L	24
004	MW-4	Aqueous	Carbon disulfide	8260B	0.53	J	ug/L	25
004	MW-4	Aqueous	Arsenic	6020A	2.0		ug/L	27
004	MW-4	Aqueous	Barium	6020A	390		ug/L	27
004	MW-4	Aqueous	Beryllium	6020A	0.19	J	ug/L	27
004	MW-4	Aqueous	Boron	6020A	8.1	J	ug/L	27
004	MW-4	Aqueous	Cadmium	6020A	0.057	J	ug/L	27
004	MW-4	Aqueous	Calcium	6020A	44000	B	ug/L	27
004	MW-4	Aqueous	Chromium	6020A	2.5	J	ug/L	27
004	MW-4	Aqueous	Cobalt	6020A	7.6		ug/L	27
004	MW-4	Aqueous	Copper	6020A	5.3	B	ug/L	27
004	MW-4	Aqueous	Lead	6020A	2.8		ug/L	27
004	MW-4	Aqueous	Molybdenum	6020A	1.6	J	ug/L	27
004	MW-4	Aqueous	Nickel	6020A	8.2		ug/L	27
004	MW-4	Aqueous	Selenium	6020A	5.9		ug/L	27
004	MW-4	Aqueous	Vanadium	6020A	5.9		ug/L	27
004	MW-4	Aqueous	Zinc	6020A	31		ug/L	27
005	MW-5	Aqueous	Chloride	300.0	22		mg/L	29
005	MW-5	Aqueous	Fluoride	300.0	0.74		mg/L	29
005	MW-5	Aqueous	Sulfate	300.0	4.1		mg/L	29
005	MW-5	Aqueous	TDS	SM 2540C-	230		mg/L	29

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Executive Summary (Continued)

Lot Number: QH13039

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
005	MW-5	Aqueous	Carbon disulfide	8260B	0.93	J	ug/L	30
005	MW-5	Aqueous	Antimony	6020A	0.58	J	ug/L	32
005	MW-5	Aqueous	Arsenic	6020A	0.75	J	ug/L	32
005	MW-5	Aqueous	Barium	6020A	160		ug/L	32
005	MW-5	Aqueous	Boron	6020A	11	J	ug/L	32
005	MW-5	Aqueous	Calcium	6020A	17000	B	ug/L	32
005	MW-5	Aqueous	Chromium	6020A	1.8	J	ug/L	32
005	MW-5	Aqueous	Cobalt	6020A	1.5	J	ug/L	32
005	MW-5	Aqueous	Copper	6020A	3.2	B	ug/L	32
005	MW-5	Aqueous	Lead	6020A	1.2		ug/L	32
005	MW-5	Aqueous	Molybdenum	6020A	1.5	J	ug/L	32
005	MW-5	Aqueous	Nickel	6020A	3.0	J	ug/L	32
005	MW-5	Aqueous	Selenium	6020A	1.0		ug/L	32
005	MW-5	Aqueous	Vanadium	6020A	3.8	J	ug/L	32
005	MW-5	Aqueous	Zinc	6020A	16		ug/L	32
006	MW-6	Aqueous	Chloride	300.0	230		mg/L	34
006	MW-6	Aqueous	Fluoride	300.0	0.49	J	mg/L	34
006	MW-6	Aqueous	Sulfate	300.0	48		mg/L	34
006	MW-6	Aqueous	TDS	SM 2540C-	680	B	mg/L	34
006	MW-6	Aqueous	Acetone	8260B	1.6	J	ug/L	35
006	MW-6	Aqueous	Carbon disulfide	8260B	0.52	J	ug/L	35
006	MW-6	Aqueous	Antimony	6020A	0.53	J	ug/L	37
006	MW-6	Aqueous	Arsenic	6020A	1.2		ug/L	37
006	MW-6	Aqueous	Barium	6020A	100		ug/L	37
006	MW-6	Aqueous	Boron	6020A	8.1	J	ug/L	37
006	MW-6	Aqueous	Calcium	6020A	38000	B	ug/L	37
006	MW-6	Aqueous	Chromium	6020A	0.70	J	ug/L	37
006	MW-6	Aqueous	Cobalt	6020A	2.2	J	ug/L	37
006	MW-6	Aqueous	Copper	6020A	1.1	B	ug/L	37
006	MW-6	Aqueous	Lead	6020A	0.45	J	ug/L	37
006	MW-6	Aqueous	Molybdenum	6020A	1.4	J	ug/L	37
006	MW-6	Aqueous	Nickel	6020A	2.6	J	ug/L	37
006	MW-6	Aqueous	Selenium	6020A	4.3		ug/L	37
006	MW-6	Aqueous	Vanadium	6020A	1.6	J	ug/L	37
006	MW-6	Aqueous	Zinc	6020A	5.8	J	ug/L	37
007	MW-7	Aqueous	Chloride	300.0	430		mg/L	39
007	MW-7	Aqueous	Fluoride	300.0	0.45	J	mg/L	39
007	MW-7	Aqueous	Sulfate	300.0	36		mg/L	39
007	MW-7	Aqueous	TDS	SM 2540C-	1100	B	mg/L	39
007	MW-7	Aqueous	Bromodichloromethane	8260B	3.5		ug/L	40
007	MW-7	Aqueous	Bromoform	8260B	1.1		ug/L	40
007	MW-7	Aqueous	Carbon disulfide	8260B	0.51	J	ug/L	40
007	MW-7	Aqueous	Chloroform	8260B	2.0		ug/L	40
007	MW-7	Aqueous	Dibromochloromethane	8260B	4.4		ug/L	40
007	MW-7	Aqueous	Dibromomethane	8260B	0.31	J	ug/L	40
007	MW-7	Aqueous	Antimony	6020A	0.63	J	ug/L	42
007	MW-7	Aqueous	Arsenic	6020A	2.1		ug/L	42
007	MW-7	Aqueous	Barium	6020A	290		ug/L	42

Executive Summary (Continued)

Lot Number: QH13039

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
007	MW-7	Aqueous	Boron	6020A	98		ug/L	42
007	MW-7	Aqueous	Cadmium	6020A	0.18		ug/L	42
007	MW-7	Aqueous	Calcium	6020A	37000	B	ug/L	42
007	MW-7	Aqueous	Chromium	6020A	0.84	J	ug/L	42
007	MW-7	Aqueous	Cobalt	6020A	1.2	J	ug/L	42
007	MW-7	Aqueous	Copper	6020A	1.3	B	ug/L	42
007	MW-7	Aqueous	Lead	6020A	0.20	J	ug/L	42
007	MW-7	Aqueous	Molybdenum	6020A	3.6	J	ug/L	42
007	MW-7	Aqueous	Nickel	6020A	4.3	J	ug/L	42
007	MW-7	Aqueous	Selenium	6020A	8.4		ug/L	42
007	MW-7	Aqueous	Vanadium	6020A	1.5	J	ug/L	42
007	MW-7	Aqueous	Zinc	6020A	4.0	J	ug/L	42
008	MW-8	Aqueous	Chloride	300.0	470		mg/L	44
008	MW-8	Aqueous	Sulfate	300.0	6.3		mg/L	44
008	MW-8	Aqueous	TDS	SM 2540C-	1300	B	mg/L	44
008	MW-8	Aqueous	Carbon disulfide	8260B	0.54	J	ug/L	45
008	MW-8	Aqueous	Antimony	6020A	0.68	J	ug/L	47
008	MW-8	Aqueous	Arsenic	6020A	3.2		ug/L	47
008	MW-8	Aqueous	Barium	6020A	1100		ug/L	47
008	MW-8	Aqueous	Boron	6020A	9.9	J	ug/L	47
008	MW-8	Aqueous	Cadmium	6020A	0.071	J	ug/L	47
008	MW-8	Aqueous	Calcium	6020A	110000	B	ug/L	47
008	MW-8	Aqueous	Chromium	6020A	1.7	J	ug/L	47
008	MW-8	Aqueous	Cobalt	6020A	0.34	J	ug/L	47
008	MW-8	Aqueous	Copper	6020A	1.5	B	ug/L	47
008	MW-8	Aqueous	Lead	6020A	0.53	J	ug/L	47
008	MW-8	Aqueous	Nickel	6020A	2.4	J	ug/L	47
008	MW-8	Aqueous	Selenium	6020A	6.6		ug/L	47
008	MW-8	Aqueous	Silver	6020A	1.6		ug/L	47
008	MW-8	Aqueous	Vanadium	6020A	2.5	J	ug/L	47
008	MW-8	Aqueous	Zinc	6020A	5.1	J	ug/L	47
009	BG-1	Aqueous	Chloride	300.0	270		mg/L	49
009	BG-1	Aqueous	Fluoride	300.0	0.22	J	mg/L	49
009	BG-1	Aqueous	Sulfate	300.0	23		mg/L	49
009	BG-1	Aqueous	TDS	SM 2540C-	690	B	mg/L	49
009	BG-1	Aqueous	Antimony	6020A	0.55	J	ug/L	52
009	BG-1	Aqueous	Arsenic	6020A	2.2		ug/L	52
009	BG-1	Aqueous	Barium	6020A	380		ug/L	52
009	BG-1	Aqueous	Beryllium	6020A	0.12	J	ug/L	52
009	BG-1	Aqueous	Boron	6020A	8.5	J	ug/L	52
009	BG-1	Aqueous	Cadmium	6020A	0.061	J	ug/L	52
009	BG-1	Aqueous	Calcium	6020A	32000	B	ug/L	52
009	BG-1	Aqueous	Cobalt	6020A	0.88	J	ug/L	52
009	BG-1	Aqueous	Copper	6020A	1.4	B	ug/L	52
009	BG-1	Aqueous	Lead	6020A	1.3		ug/L	52
009	BG-1	Aqueous	Molybdenum	6020A	0.55	J	ug/L	52
009	BG-1	Aqueous	Nickel	6020A	1.3	J	ug/L	52
009	BG-1	Aqueous	Selenium	6020A	4.5		ug/L	52

Executive Summary (Continued)

Lot Number: QH13039

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
009	BG-1	Aqueous	Vanadium	6020A	6.0		ug/L	52
009	BG-1	Aqueous	Zinc	6020A	8.3	J	ug/L	52
009	BG-1	Aqueous	Mercury	7470A	0.000075	J	mg/L	53
010	SW-1	Aqueous	Chloride	300.0	8.0		mg/L	54
010	SW-1	Aqueous	Fluoride	300.0	0.090	J	mg/L	54
010	SW-1	Aqueous	Sulfate	300.0	0.89	J	mg/L	54
010	SW-1	Aqueous	TDS	SM 2540C-	53	B	mg/L	54
010	SW-1	Aqueous	Acetone	8260B	3.6	J	ug/L	55
010	SW-1	Aqueous	Antimony	6020A	0.48	J	ug/L	57
010	SW-1	Aqueous	Arsenic	6020A	1.1		ug/L	57
010	SW-1	Aqueous	Barium	6020A	49		ug/L	57
010	SW-1	Aqueous	Boron	6020A	9.4	J	ug/L	57
010	SW-1	Aqueous	Cadmium	6020A	0.050	J	ug/L	57
010	SW-1	Aqueous	Calcium	6020A	4200	B	ug/L	57
010	SW-1	Aqueous	Cobalt	6020A	1.3	J	ug/L	57
010	SW-1	Aqueous	Copper	6020A	1.2	B	ug/L	57
010	SW-1	Aqueous	Lead	6020A	0.38	J	ug/L	57
010	SW-1	Aqueous	Molybdenum	6020A	1.0	J	ug/L	57
010	SW-1	Aqueous	Nickel	6020A	1.5	J	ug/L	57
010	SW-1	Aqueous	Zinc	6020A	28		ug/L	57
011	SW-2	Aqueous	Chloride	300.0	20		mg/L	59
011	SW-2	Aqueous	Fluoride	300.0	0.29		mg/L	59
011	SW-2	Aqueous	Sulfate	300.0	2.2		mg/L	59
011	SW-2	Aqueous	TDS	SM 2540C-	180	B	mg/L	59
011	SW-2	Aqueous	Acetone	8260B	7.3	J	ug/L	60
011	SW-2	Aqueous	Antimony	6020A	0.62	J	ug/L	62
011	SW-2	Aqueous	Arsenic	6020A	2.9		ug/L	62
011	SW-2	Aqueous	Barium	6020A	110		ug/L	62
011	SW-2	Aqueous	Boron	6020A	87		ug/L	62
011	SW-2	Aqueous	Calcium	6020A	12000	B	ug/L	62
011	SW-2	Aqueous	Cobalt	6020A	1.4	J	ug/L	62
011	SW-2	Aqueous	Copper	6020A	1.5	B	ug/L	62
011	SW-2	Aqueous	Lead	6020A	1.2		ug/L	62
011	SW-2	Aqueous	Nickel	6020A	1.8	J	ug/L	62
011	SW-2	Aqueous	Selenium	6020A	1.6		ug/L	62
011	SW-2	Aqueous	Vanadium	6020A	3.7	J	ug/L	62
011	SW-2	Aqueous	Zinc	6020A	7.0	J	ug/L	62
012	EQUIPMENT BLANK	Aqueous	Antimony	6020A	0.38	J	ug/L	67
012	EQUIPMENT BLANK	Aqueous	Arsenic	6020A	0.37	J	ug/L	67
012	EQUIPMENT BLANK	Aqueous	Barium	6020A	1.0	J	ug/L	67
012	EQUIPMENT BLANK	Aqueous	Boron	6020A	1.2	J	ug/L	67
012	EQUIPMENT BLANK	Aqueous	Calcium	6020A	880	B	ug/L	67
012	EQUIPMENT BLANK	Aqueous	Copper	6020A	0.94	BJ	ug/L	67
012	EQUIPMENT BLANK	Aqueous	Zinc	6020A	4.4	J	ug/L	67

(233 detections)

Inorganic non-metals

Client: **Buxton Environmental**
Description: **BG-1**
Date Sampled: **08/12/2015 2210**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-009**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	5	09/01/2015 2011	TAF		83981
2		(Fluoride) 300.0	5	09/01/2015 2011	TAF		83979
2		(Sulfate) 300.0	5	09/01/2015 2011	TAF		83986
1		(TDS) SM 2540C-2011	1	08/19/2015 1103	BLO		82773

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**270**		**5.0**	**0.55**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.22**	**J**	**0.50**	**0.21**	**mg/L**	**2**
Sulfate		**300.0**	**23**		**5.0**	**1.4**	**mg/L**	**2**
TDS		**SM 2540C-20**	**690**	**B**	**10**	**3.4**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **BG-1**
Date Sampled: **08/12/2015 2210**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-009**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1404	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **BG-1**
Date Sampled: **08/12/2015 2210**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-009**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1404	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		78	70-130
Bromofluorobenzene		104	70-130
Toluene-d8		91	70-130

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ICP-MS

Client: **Buxton Environmental**
Description: **BG-1**
Date Sampled: **08/12/2015 2210**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-009**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0057	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 2008	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.55**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**2.2**		**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**380**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	**7440-41-7**	**6020A**	**0.12**	**J**	**0.40**	**0.12**	**ug/L**	**1**
Boron	**7440-42-8**	**6020A**	**8.5**	**J**	**25**	**0.57**	**ug/L**	**2**
Cadmium	**7440-43-9**	**6020A**	**0.061**	**J**	**0.10**	**0.044**	**ug/L**	**1**
Calcium	**7440-70-2**	**6020A**	**32000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	7440-47-3	6020A	ND		5.0	0.63	ug/L	1
Cobalt	**7440-48-4**	**6020A**	**0.88**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.4**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**1.3**		**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**0.55**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**1.3**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**4.5**		**1.0**	**0.95**	**ug/L**	**2**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	2
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**6.0**		**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**8.3**	**J**	**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Description: **BG-1**
Date Sampled: **08/12/2015 2210**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-009**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 1003	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	0.000075	J	0.00010	0.000028	mg/L	1

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-1**
Date Sampled: **08/12/2015 1115**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-001**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	5	09/01/2015 1705	TAF		83981
2		(Fluoride) 300.0	5	09/01/2015 1705	TAF		83979
2		(Sulfate) 300.0	5	09/01/2015 1705	TAF		83986
1		(TDS) SM 2540C-2011	1	08/18/2015 1930	BLO		82708

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**570**		**5.0**	**0.55**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.23**	**J**	**0.50**	**0.21**	**mg/L**	**2**
Sulfate		**300.0**	**22**		**5.0**	**1.4**	**mg/L**	**2**
TDS		**SM 2540C-20**	**1500**		**10**	**3.4**	**mg/L**	**1**

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-1**
Date Sampled: **08/12/2015 1115**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-001**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1429	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	**67-66-3**	**8260B**	**0.71**	**J**	**1.0**	**0.21**	**ug/L**	**1**
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	**106-46-7**	**8260B**	**0.19**	**J**	**1.0**	**0.19**	**ug/L**	**1**
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Laboratory ID: **QH13039-001**
Description: **MW-1**
Matrix: **Aqueous**
Date Sampled: **08/12/2015 1115**
Date Received: **08/13/2015**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1429	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		102	70-130
Bromofluorobenzene		100	70-130
Toluene-d8		105	70-130

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ICP-MS

Client: **Buxton Environmental**
Description: **MW-1**
Date Sampled: **08/12/2015 1115**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-001**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/15/2015 0520	BNW	08/14/2015 0939	82380
3	3005A	6020A	1	08/20/2015 1823	CDF	08/14/2015 0939	82380

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.23**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**2.8**		**1.0**	**0.26**	**ug/L**	**1**
Barium	**7440-39-3**	**6020A**	**220**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**6.9**	**J**	**25**	**0.57**	**ug/L**	**1**
Cadmium	**7440-43-9**	**6020A**	**0.13**		**0.10**	**0.044**	**ug/L**	**1**
Calcium	**7440-70-2**	**6020A**	**150000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	**7440-47-3**	**6020A**	**0.92**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**0.35**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**0.87**	**BJ**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**0.34**	**J**	**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**0.95**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**2.5**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**8.1**		**1.0**	**0.95**	**ug/L**	**1**
Silver	**7440-22-4**	**6020A**	**0.50**	**J**	**1.0**	**0.17**	**ug/L**	**3**
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**2.7**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**6.3**	**J**	**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Description: **MW-1**
Date Sampled: **08/12/2015 1115**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-001**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0944	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-2**
Date Sampled: **08/12/2015 1240**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-002**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Chloride) 300.0	25	08/31/2015 0304	TAF		83809
1		(Fluoride) 300.0	25	08/31/2015 0304	TAF		83816
1		(Sulfate) 300.0	25	08/31/2015 0304	TAF		83818
1		(TDS) SM 2540C-2011	1	08/18/2015 1930	BLO		82708

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**790**		**25**	**2.7**	**mg/L**	**1**
Fluoride	16984-48-8	300.0	ND		2.5	1.0	mg/L	1
Sulfate		**300.0**	**79**		**25**	**6.9**	**mg/L**	**1**
TDS		**SM 2540C-20**	**1700**		**10**	**3.4**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-2**
Date Sampled: **08/12/2015 1240**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-002**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1452	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	**67-64-1**	**8260B**	**1.6**	**J**	**20**	**1.6**	**ug/L**	**1**
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	**75-27-4**	**8260B**	**4.0**		**1.0**	**0.23**	**ug/L**	**1**
Bromoform	**75-25-2**	**8260B**	**1.4**		**1.0**	**0.35**	**ug/L**	**1**
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	**75-15-0**	**8260B**	**0.54**	**J**	**1.0**	**0.45**	**ug/L**	**1**
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	**67-66-3**	**8260B**	**4.5**		**1.0**	**0.21**	**ug/L**	**1**
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	**124-48-1**	**8260B**	**3.7**		**1.0**	**0.23**	**ug/L**	**1**
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
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P = The RPD between two GC columns exceeds 40%
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-2**
Date Sampled: **08/12/2015 1240**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-002**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1452	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		101	70-130
Bromofluorobenzene		100	70-130
Toluene-d8		105	70-130

PQL = Practical quantitation limit
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ICP-MS

Client: **Buxton Environmental**
Description: **MW-2**
Date Sampled: **08/12/2015 1240**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-002**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/15/2015 0741	BNW	08/14/2015 1445	82426
2	3005A	6020A	1	08/19/2015 0433	CDF	08/14/2015 1445	82426
3	3005A	6020A	1	08/20/2015 1901	CDF	08/14/2015 1445	82426

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	7440-36-0	6020A	0.49	J	1.0	0.17	ug/L	2
Arsenic	7440-38-2	6020A	3.2		1.0	0.26	ug/L	1
Barium	7440-39-3	6020A	260		5.0	0.53	ug/L	1
Beryllium	7440-41-7	6020A	0.17	J	0.40	0.12	ug/L	1
Boron	7440-42-8	6020A	36		25	0.57	ug/L	3
Cadmium	7440-43-9	6020A	0.060	J	0.10	0.044	ug/L	2
Calcium	7440-70-2	6020A	97000	B	200	11	ug/L	1
Chromium	7440-47-3	6020A	5.2		5.0	0.63	ug/L	1
Cobalt	7440-48-4	6020A	1.6	J	5.0	0.26	ug/L	1
Copper	7440-50-8	6020A	4.1	B	1.0	0.15	ug/L	1
Lead	7439-92-1	6020A	2.0		1.0	0.15	ug/L	1
Molybdenum	7439-98-7	6020A	11		10	0.51	ug/L	1
Nickel	7440-02-0	6020A	5.4		5.0	0.63	ug/L	1
Selenium	7782-49-2	6020A	7.7		1.0	0.95	ug/L	1
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	3
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	7440-62-2	6020A	4.8	J	5.0	1.0	ug/L	1
Zinc	7440-66-6	6020A	12		10	1.6	ug/L	1

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CVAA

Client: **Buxton Environmental**
Description: **MW-2**
Date Sampled: **08/12/2015 1240**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-002**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0946	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-3**
Date Sampled: **08/12/2015 1410**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-003**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Chloride) 300.0	25	08/31/2015 0327	TAF		83809
1		(Fluoride) 300.0	25	08/31/2015 0327	TAF		83816
1		(Sulfate) 300.0	25	08/31/2015 0327	TAF		83818
1		(TDS) SM 2540C-2011	1	08/18/2015 1930	BLO		82708

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**990**		**25**	**2.7**	**mg/L**	**1**
Fluoride	16984-48-8	300.0	ND		2.5	1.0	mg/L	1
Sulfate		**300.0**	**24**	**J**	**25**	**6.9**	**mg/L**	**1**
TDS		**SM 2540C-20**	**2100**		**10**	**3.4**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-3**
Date Sampled: **08/12/2015 1410**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-003**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1515	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	**67-64-1**	**8260B**	**1.8**	**J**	**20**	**1.6**	**ug/L**	**1**
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	**75-27-4**	**8260B**	**1.7**		**1.0**	**0.23**	**ug/L**	**1**
Bromoform	**75-25-2**	**8260B**	**1.0**		**1.0**	**0.35**	**ug/L**	**1**
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	**67-66-3**	**8260B**	**1.2**		**1.0**	**0.21**	**ug/L**	**1**
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	**124-48-1**	**8260B**	**2.6**		**1.0**	**0.23**	**ug/L**	**1**
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-3**
Date Sampled: **08/12/2015 1410**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-003**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1515	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		102	70-130
Bromofluorobenzene		96	70-130
Toluene-d8		99	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
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ICP-MS

Client: **Buxton Environmental**
Description: **MW-3**
Date Sampled: **08/12/2015 1410**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-003**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/15/2015 0814	BNW	08/14/2015 1445	82426
2	3005A	6020A	1	08/19/2015 0506	CDF	08/14/2015 1445	82426
3	3005A	6020A	1	08/20/2015 1920	CDF	08/14/2015 1445	82426

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.31**	**J**	**1.0**	**0.17**	**ug/L**	**2**
Arsenic	**7440-38-2**	**6020A**	**6.7**		**1.0**	**0.26**	**ug/L**	**1**
Barium	**7440-39-3**	**6020A**	**670**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**34**		**25**	**0.57**	**ug/L**	**1**
Cadmium	7440-43-9	6020A	ND		0.10	0.044	ug/L	2
Calcium	**7440-70-2**	**6020A**	**150000**	**B**	**200**	**11**	**ug/L**	**3**
Chromium	**7440-47-3**	**6020A**	**1.1**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**0.64**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.6**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**0.27**	**J**	**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**19**		**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**3.5**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**15**		**1.0**	**0.95**	**ug/L**	**1**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	3
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**2.5**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**5.1**	**J**	**10**	**1.6**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
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E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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CVAA

Client: **Buxton Environmental**
Description: **MW-3**
Date Sampled: **08/12/2015 1410**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-003**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0948	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-4**
Date Sampled: **08/12/2015 1520**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-004**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	5	09/01/2015 1728	TAF		83981
2		(Fluoride) 300.0	5	09/01/2015 1728	TAF		83979
2		(Sulfate) 300.0	5	09/01/2015 1728	TAF		83986
1		(TDS) SM 2540C-2011	1	08/18/2015 1930	BLO		82708

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**320**		**5.0**	**0.55**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.51**		**0.50**	**0.21**	**mg/L**	**2**
Sulfate		**300.0**	**11**		**5.0**	**1.4**	**mg/L**	**2**
TDS		**SM 2540C-20**	**820**		**10**	**3.4**	**mg/L**	**1**

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ND = Not detected at or above the MDL
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Laboratory ID: **QH13039-004**
Description: **MW-4**
Matrix: **Aqueous**
Date Sampled: **08/12/2015 1520**
Date Received: **08/13/2015**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1538	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	**75-15-0**	**8260B**	**0.53**	**J**	**1.0**	**0.45**	**ug/L**	**1**
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-4**
Date Sampled: **08/12/2015 1520**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-004**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1538	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		97	70-130
Bromofluorobenzene		95	70-130
Toluene-d8		104	70-130

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ICP-MS

Client: **Buxton Environmental**
Description: **MW-4**
Date Sampled: **08/12/2015 1520**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-004**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/15/2015 0819	BNW	08/14/2015 1445	82426
2	3005A	6020A	1	08/19/2015 0511	CDF	08/14/2015 1445	82426
3	3005A	6020A	1	08/20/2015 1925	CDF	08/14/2015 1445	82426

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	7440-36-0	6020A	ND		1.0	0.17	ug/L	2
Arsenic	**7440-38-2**	**6020A**	**2.0**		**1.0**	**0.26**	**ug/L**	**1**
Barium	**7440-39-3**	**6020A**	**390**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	**7440-41-7**	**6020A**	**0.19**	**J**	**0.40**	**0.12**	**ug/L**	**1**
Boron	**7440-42-8**	**6020A**	**8.1**	**J**	**25**	**0.57**	**ug/L**	**1**
Cadmium	**7440-43-9**	**6020A**	**0.057**	**J**	**0.10**	**0.044**	**ug/L**	**2**
Calcium	**7440-70-2**	**6020A**	**44000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	**7440-47-3**	**6020A**	**2.5**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**7.6**		**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**5.3**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**2.8**		**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**1.6**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**8.2**		**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**5.9**		**1.0**	**0.95**	**ug/L**	**1**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	3
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**5.9**		**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**31**		**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Description: **MW-4**
Date Sampled: **08/12/2015 1520**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-004**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0950	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-5**
Date Sampled: **08/12/2015 1625**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-005**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	1	09/01/2015 1752	TAF		83981
2		(Fluoride) 300.0	1	09/01/2015 1752	TAF		83979
2		(Sulfate) 300.0	1	09/01/2015 1752	TAF		83986
1		(TDS) SM 2540C-2011	1	08/18/2015 1930	BLO		82708

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**22**		**1.0**	**0.11**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.74**		**0.10**	**0.041**	**mg/L**	**2**
Sulfate		**300.0**	**4.1**		**1.0**	**0.28**	**mg/L**	**2**
TDS		**SM 2540C-20**	**230**		**10**	**3.4**	**mg/L**	**1**

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ND = Not detected at or above the MDL
B = Detected in the method blank
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-5**
Date Sampled: **08/12/2015 1625**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-005**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1601	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	**75-15-0**	**8260B**	**0.93**	**J**	**1.0**	**0.45**	**ug/L**	**1**
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Laboratory ID: **QH13039-005**
Description: **MW-5**
Matrix: **Aqueous**
Date Sampled: **08/12/2015 1625**
Date Received: **08/13/2015**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1601	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		102	70-130
Bromofluorobenzene		100	70-130
Toluene-d8		106	70-130

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

ICP-MS

Client: **Buxton Environmental**
Description: **MW-5**
Date Sampled: **08/12/2015 1625**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-005**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/15/2015 0825	BNW	08/14/2015 1445	82426
2	3005A	6020A	1	08/19/2015 0516	CDF	08/14/2015 1445	82426
3	3005A	6020A	1	08/20/2015 1930	CDF	08/14/2015 1445	82426

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.58**	**J**	**1.0**	**0.17**	**ug/L**	**2**
Arsenic	**7440-38-2**	**6020A**	**0.75**	**J**	**1.0**	**0.26**	**ug/L**	**1**
Barium	**7440-39-3**	**6020A**	**160**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**11**	**J**	**25**	**0.57**	**ug/L**	**1**
Cadmium	7440-43-9	6020A	ND		0.10	0.044	ug/L	2
Calcium	**7440-70-2**	**6020A**	**17000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	**7440-47-3**	**6020A**	**1.8**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**1.5**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**3.2**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**1.2**		**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**1.5**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**3.0**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**1.0**		**1.0**	**0.95**	**ug/L**	**1**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	3
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**3.8**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**16**		**10**	**1.6**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
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E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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CVAA

Client: **Buxton Environmental**
Description: **MW-5**
Date Sampled: **08/12/2015 1625**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-005**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0952	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
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H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-6**
Date Sampled: **08/12/2015 1830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-006**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	5	09/01/2015 1901	TAF		83981
2		(Fluoride) 300.0	5	09/01/2015 1901	TAF		83979
2		(Sulfate) 300.0	5	09/01/2015 1901	TAF		83986
1		(TDS) SM 2540C-2011	1	08/19/2015 1103	BLO		82773

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**230**		**5.0**	**0.55**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.49**	**J**	**0.50**	**0.21**	**mg/L**	**2**
Sulfate		**300.0**	**48**		**5.0**	**1.4**	**mg/L**	**2**
TDS		**SM 2540C-20**	**680**	**B**	**10**	**3.4**	**mg/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-6**
Date Sampled: **08/12/2015 1830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-006**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1624	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	**67-64-1**	**8260B**	**1.6**	**J**	**20**	**1.6**	**ug/L**	**1**
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	**75-15-0**	**8260B**	**0.52**	**J**	**1.0**	**0.45**	**ug/L**	**1**
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-6**
Date Sampled: **08/12/2015 1830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-006**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1624	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	70-130
Bromofluorobenzene		98	70-130
Toluene-d8		100	70-130

PQL = Practical quantitation limit
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Client: **Buxton Environmental**
Description: **MW-6**
Date Sampled: **08/12/2015 1830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-006**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0040	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 1954	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.53**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**1.2**		**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**100**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**8.1**	**J**	**25**	**0.57**	**ug/L**	**2**
Cadmium	7440-43-9	6020A	ND		0.10	0.044	ug/L	1
Calcium	**7440-70-2**	**6020A**	**38000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	**7440-47-3**	**6020A**	**0.70**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**2.2**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.1**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**0.45**	**J**	**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**1.4**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**2.6**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**4.3**		**1.0**	**0.95**	**ug/L**	**2**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	2
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**1.6**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**5.8**	**J**	**10**	**1.6**	**ug/L**	**1**

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

CVAA

Client: **Buxton Environmental**
Description: **MW-6**
Date Sampled: **08/12/2015 1830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-006**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0957	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-7**
Date Sampled: **08/12/2015 1930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-007**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	5	09/01/2015 1925	TAF		83981
2		(Fluoride) 300.0	5	09/01/2015 1925	TAF		83979
2		(Sulfate) 300.0	5	09/01/2015 1925	TAF		83986
1		(TDS) SM 2540C-2011	1	08/19/2015 1103	BLO		82773

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**430**		**5.0**	**0.55**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.45**	**J**	**0.50**	**0.21**	**mg/L**	**2**
Sulfate		**300.0**	**36**		**5.0**	**1.4**	**mg/L**	**2**
TDS		**SM 2540C-20**	**1100**	**B**	**10**	**3.4**	**mg/L**	**1**

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ND = Not detected at or above the MDL
B = Detected in the method blank
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-7**
Date Sampled: **08/12/2015 1930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-007**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1647	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	**75-27-4**	**8260B**	**3.5**		**1.0**	**0.23**	**ug/L**	**1**
Bromoform	**75-25-2**	**8260B**	**1.1**		**1.0**	**0.35**	**ug/L**	**1**
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	**75-15-0**	**8260B**	**0.51**	**J**	**1.0**	**0.45**	**ug/L**	**1**
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	**67-66-3**	**8260B**	**2.0**		**1.0**	**0.21**	**ug/L**	**1**
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	**124-48-1**	**8260B**	**4.4**		**1.0**	**0.23**	**ug/L**	**1**
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	**74-95-3**	**8260B**	**0.31**	**J**	**1.0**	**0.26**	**ug/L**	**1**
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-7**
Date Sampled: **08/12/2015 1930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-007**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1647	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		99	70-130
Bromofluorobenzene		98	70-130
Toluene-d8		103	70-130

PQL = Practical quantitation limit
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ICP-MS

Client: **Buxton Environmental**
Description: **MW-7**
Date Sampled: **08/12/2015 1930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-007**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0046	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 1958	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.63**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**2.1**		**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**290**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**98**		**25**	**0.57**	**ug/L**	**2**
Cadmium	**7440-43-9**	**6020A**	**0.18**		**0.10**	**0.044**	**ug/L**	**1**
Calcium	**7440-70-2**	**6020A**	**37000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	**7440-47-3**	**6020A**	**0.84**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**1.2**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.3**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**0.20**	**J**	**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**3.6**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**4.3**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**8.4**		**1.0**	**0.95**	**ug/L**	**2**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	2
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**1.5**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**4.0**	**J**	**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Laboratory ID: **QH13039-007**
Description: **MW-7**
Matrix: **Aqueous**
Date Sampled: **08/12/2015 1930**
Date Received: **08/13/2015**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 0959	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
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ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Inorganic non-metals

Client: **Buxton Environmental**
Description: **MW-8**
Date Sampled: **08/12/2015 2040**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-008**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	5	09/01/2015 1948	TAF		83981
2		(Fluoride) 300.0	5	09/01/2015 1948	TAF		83979
2		(Sulfate) 300.0	5	09/01/2015 1948	TAF		83986
1		(TDS) SM 2540C-2011	1	08/19/2015 1103	BLO		82773

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**470**		**5.0**	**0.55**	**mg/L**	**2**
Fluoride	16984-48-8	300.0	ND		0.50	0.21	mg/L	2
Sulfate		**300.0**	**6.3**		**5.0**	**1.4**	**mg/L**	**2**
TDS		**SM 2540C-20**	**1300**	**B**	**10**	**3.4**	**mg/L**	**1**

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P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-8**
Date Sampled: **08/12/2015 2040**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-008**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1710	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	**75-15-0**	**8260B**	**0.54**	**J**	**1.0**	**0.45**	**ug/L**	**1**
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

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ND = Not detected at or above the MDL
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **MW-8**
Date Sampled: **08/12/2015 2040**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-008**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/18/2015 1710	DCS		82615

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		102	70-130
Bromofluorobenzene		102	70-130
Toluene-d8		104	70-130

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ICP-MS

Client: **Buxton Environmental**
Description: **MW-8**
Date Sampled: **08/12/2015 2040**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-008**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0051	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 2003	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.68**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**3.2**		**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**1100**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**9.9**	**J**	**25**	**0.57**	**ug/L**	**2**
Cadmium	**7440-43-9**	**6020A**	**0.071**	**J**	**0.10**	**0.044**	**ug/L**	**1**
Calcium	**7440-70-2**	**6020A**	**110000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	**7440-47-3**	**6020A**	**1.7**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Cobalt	**7440-48-4**	**6020A**	**0.34**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.5**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**0.53**	**J**	**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	7439-98-7	6020A	ND		10	0.51	ug/L	1
Nickel	**7440-02-0**	**6020A**	**2.4**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**6.6**		**1.0**	**0.95**	**ug/L**	**2**
Silver	**7440-22-4**	**6020A**	**1.6**		**1.0**	**0.17**	**ug/L**	**2**
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**2.5**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**5.1**	**J**	**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Description: **MW-8**
Date Sampled: **08/12/2015 2040**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-008**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 1001	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **SW-1**
Date Sampled: **08/13/2015 0745**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-010**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	1	09/01/2015 2121	TAF		83981
2		(Fluoride) 300.0	1	09/01/2015 2121	TAF		83979
2		(Sulfate) 300.0	1	09/01/2015 2121	TAF		83986
1		(TDS) SM 2540C-2011	1	08/17/2015 1038	BLO		82528

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**8.0**		**1.0**	**0.11**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.090**	**J**	**0.10**	**0.041**	**mg/L**	**2**
Sulfate		**300.0**	**0.89**	**J**	**1.0**	**0.28**	**mg/L**	**2**
TDS		**SM 2540C-20**	**53**	**B**	**10**	**3.4**	**mg/L**	**1**

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P = The RPD between two GC columns exceeds 40%
H = Out of holding time
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **SW-1**
Date Sampled: **08/13/2015 0745**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-010**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1426	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	**67-64-1**	**8260B**	**3.6**	**J**	**20**	**1.6**	**ug/L**	**1**
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
H = Out of holding time
ND = Not detected at or above the MDL
J = Estimated result < PQL and ≥ MDL
P = The RPD between two GC columns exceeds 40%
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **SW-1**
Date Sampled: **08/13/2015 0745**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-010**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1426	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		80	70-130
Bromofluorobenzene		110	70-130
Toluene-d8		92	70-130

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ICP-MS

Client: **Buxton Environmental**
Description: **SW-1**
Date Sampled: **08/13/2015 0745**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-010**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0102	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 2012	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.48**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**1.1**		**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**49**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**9.4**	**J**	**25**	**0.57**	**ug/L**	**2**
Cadmium	**7440-43-9**	**6020A**	**0.050**	**J**	**0.10**	**0.044**	**ug/L**	**1**
Calcium	**7440-70-2**	**6020A**	**4200**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	7440-47-3	6020A	ND		5.0	0.63	ug/L	1
Cobalt	**7440-48-4**	**6020A**	**1.3**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.2**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**0.38**	**J**	**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	**7439-98-7**	**6020A**	**1.0**	**J**	**10**	**0.51**	**ug/L**	**1**
Nickel	**7440-02-0**	**6020A**	**1.5**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	7782-49-2	6020A	ND		1.0	0.95	ug/L	2
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	2
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	7440-62-2	6020A	ND		5.0	1.0	ug/L	1
Zinc	**7440-66-6**	**6020A**	**28**		**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Description: **SW-1**
Date Sampled: **08/13/2015 0745**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-010**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 1005	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **SW-2**
Date Sampled: **08/13/2015 0830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-011**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2		(Chloride) 300.0	1	09/01/2015 2145	TAF		83981
2		(Fluoride) 300.0	1	09/01/2015 2145	TAF		83979
2		(Sulfate) 300.0	1	09/01/2015 2145	TAF		83986
1		(TDS) SM 2540C-2011	1	08/17/2015 1038	BLO		82528

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		**300.0**	**20**		**1.0**	**0.11**	**mg/L**	**2**
Fluoride	**16984-48-8**	**300.0**	**0.29**		**0.10**	**0.041**	**mg/L**	**2**
Sulfate		**300.0**	**2.2**		**1.0**	**0.28**	**mg/L**	**2**
TDS		**SM 2540C-20**	**180**	**B**	**10**	**3.4**	**mg/L**	**1**

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **SW-2**
Date Sampled: **08/13/2015 0830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-011**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1449	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	**67-64-1**	**8260B**	**7.3**	**J**	**20**	**1.6**	**ug/L**	**1**
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **SW-2**
Date Sampled: **08/13/2015 0830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-011**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1449	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		78	70-130
Bromofluorobenzene		106	70-130
Toluene-d8		90	70-130

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Client: **Buxton Environmental**
Laboratory ID: **QH13039-011**
Description: **SW-2**
Matrix: **Aqueous**
Date Sampled: **08/13/2015 0830**
Date Received: **08/13/2015**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0107	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 2017	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.62**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**2.9**		**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**110**		**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**87**		**25**	**0.57**	**ug/L**	**2**
Cadmium	7440-43-9	6020A	ND		0.10	0.044	ug/L	1
Calcium	**7440-70-2**	**6020A**	**12000**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	7440-47-3	6020A	ND		5.0	0.63	ug/L	1
Cobalt	**7440-48-4**	**6020A**	**1.4**	**J**	**5.0**	**0.26**	**ug/L**	**1**
Copper	**7440-50-8**	**6020A**	**1.5**	**B**	**1.0**	**0.15**	**ug/L**	**1**
Lead	**7439-92-1**	**6020A**	**1.2**		**1.0**	**0.15**	**ug/L**	**1**
Molybdenum	7439-98-7	6020A	ND		10	0.51	ug/L	1
Nickel	**7440-02-0**	**6020A**	**1.8**	**J**	**5.0**	**0.63**	**ug/L**	**1**
Selenium	**7782-49-2**	**6020A**	**1.6**		**1.0**	**0.95**	**ug/L**	**2**
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	2
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	**7440-62-2**	**6020A**	**3.7**	**J**	**5.0**	**1.0**	**ug/L**	**1**
Zinc	**7440-66-6**	**6020A**	**7.0**	**J**	**10**	**1.6**	**ug/L**	**1**

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CVAA

Client: **Buxton Environmental**
Description: **SW-2**
Date Sampled: **08/13/2015 0830**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-011**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 1007	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Inorganic non-metals

Client: **Buxton Environmental**
Description: **EQUIPMENT BLANK**
Date Sampled: **08/12/2015 0930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-012**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Chloride) 300.0	25	08/31/2015 0744	TAF		83809
1		(Fluoride) 300.0	1	08/31/2015 0744	TAF		83816
1		(Sulfate) 300.0	1	08/31/2015 0744	TAF		83818
1		(TDS) SM 2540C-2011	1	08/17/2015 1038	BLO		82528

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Chloride		300.0	ND		25	2.7	mg/L	1
Fluoride	16984-48-8	300.0	ND		0.10	0.041	mg/L	1
Sulfate		300.0	ND		1.0	0.28	mg/L	1
TDS		SM 2540C-20	ND		10	3.4	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
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Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **EQUIPMENT BLANK**
Date Sampled: **08/12/2015 0930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-012**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1211	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **EQUIPMENT BLANK**
Date Sampled: **08/12/2015 0930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-012**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1211	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		80	70-130
Bromofluorobenzene		112	70-130
Toluene-d8		93	70-130

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Client: **Buxton Environmental**
Description: **EQUIPMENT BLANK**
Date Sampled: **08/12/2015 0930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-012**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	3005A	6020A	1	08/19/2015 0113	CDF	08/18/2015 1130	82603
2	3005A	6020A	1	08/20/2015 2022	CDF	08/18/2015 1130	82603

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Antimony	**7440-36-0**	**6020A**	**0.38**	**J**	**1.0**	**0.17**	**ug/L**	**1**
Arsenic	**7440-38-2**	**6020A**	**0.37**	**J**	**1.0**	**0.26**	**ug/L**	**2**
Barium	**7440-39-3**	**6020A**	**1.0**	**J**	**5.0**	**0.53**	**ug/L**	**1**
Beryllium	7440-41-7	6020A	ND		0.40	0.12	ug/L	1
Boron	**7440-42-8**	**6020A**	**1.2**	**J**	**25**	**0.57**	**ug/L**	**2**
Cadmium	7440-43-9	6020A	ND		0.10	0.044	ug/L	1
Calcium	**7440-70-2**	**6020A**	**880**	**B**	**200**	**11**	**ug/L**	**1**
Chromium	7440-47-3	6020A	ND		5.0	0.63	ug/L	1
Cobalt	7440-48-4	6020A	ND		5.0	0.26	ug/L	1
Copper	**7440-50-8**	**6020A**	**0.94**	**BJ**	**1.0**	**0.15**	**ug/L**	**1**
Lead	7439-92-1	6020A	ND		1.0	0.15	ug/L	1
Molybdenum	7439-98-7	6020A	ND		10	0.51	ug/L	1
Nickel	7440-02-0	6020A	ND		5.0	0.63	ug/L	1
Selenium	7782-49-2	6020A	ND		1.0	0.95	ug/L	2
Silver	7440-22-4	6020A	ND		1.0	0.17	ug/L	2
Thallium	7440-28-0	6020A	ND		0.50	0.075	ug/L	1
Vanadium	7440-62-2	6020A	ND		5.0	1.0	ug/L	1
Zinc	**7440-66-6**	**6020A**	**4.4**	**J**	**10**	**1.6**	**ug/L**	**1**

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ND = Not detected at or above the MDL
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CVAA

Client: **Buxton Environmental**
Description: **EQUIPMENT BLANK**
Date Sampled: **08/12/2015 0930**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-012**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		7470A	1	08/18/2015 1008	COH	08/17/2015 1647	82565

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Mercury	7439-97-6	7470A	ND		0.00010	0.000028	mg/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **TRIP BLANK(SH1412)**
Date Sampled: **08/12/2015**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-013**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1233	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **TRIP BLANK(SH1412)**
Date Sampled: **08/12/2015**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-013**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1233	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		78	70-130
Bromofluorobenzene		106	70-130
Toluene-d8		91	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **TRIP BLANK(SH2271)**
Date Sampled: **08/12/2015**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-014**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1256	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Acetone	67-64-1	8260B	ND		20	1.6	ug/L	1
Acrylonitrile	107-13-1	8260B	ND		20	0.62	ug/L	1
Benzene	71-43-2	8260B	ND		1.0	0.21	ug/L	1
Bromochloromethane	74-97-5	8260B	ND		1.0	0.45	ug/L	1
Bromodichloromethane	75-27-4	8260B	ND		1.0	0.23	ug/L	1
Bromoform	75-25-2	8260B	ND		1.0	0.35	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260B	ND		2.0	0.19	ug/L	1
2-Butanone (MEK)	78-93-3	8260B	ND		10	1.8	ug/L	1
Carbon disulfide	75-15-0	8260B	ND		1.0	0.45	ug/L	1
Carbon tetrachloride	56-23-5	8260B	ND		1.0	0.31	ug/L	1
Chlorobenzene	108-90-7	8260B	ND		1.0	0.20	ug/L	1
Chloroethane	75-00-3	8260B	ND		2.0	0.28	ug/L	1
Chloroform	67-66-3	8260B	ND		1.0	0.21	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260B	ND		1.0	0.57	ug/L	1
Dibromochloromethane	124-48-1	8260B	ND		1.0	0.23	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260B	ND		1.0	0.17	ug/L	1
Dibromomethane (Methylene bromide)	74-95-3	8260B	ND		1.0	0.26	ug/L	1
trans-1,4-Dichloro-2-butene	110-57-6	8260B	ND		2.0	1.4	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260B	ND		1.0	0.46	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260B	ND		1.0	0.19	ug/L	1
1,1-Dichloroethane	75-34-3	8260B	ND		1.0	0.19	ug/L	1
1,2-Dichloroethane	107-06-2	8260B	ND		1.0	0.23	ug/L	1
1,1-Dichloroethene	75-35-4	8260B	ND		1.0	0.31	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260B	ND		1.0	0.20	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260B	ND		1.0	0.33	ug/L	1
1,2-Dichloropropane	78-87-5	8260B	ND		1.0	0.29	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260B	ND		1.0	0.30	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260B	ND		1.0	0.22	ug/L	1
Ethylbenzene	100-41-4	8260B	ND		1.0	0.21	ug/L	1
2-Hexanone	591-78-6	8260B	ND		10	0.26	ug/L	1
Methyl iodide (Iodomethane)	74-88-4	8260B	ND		5.0	0.28	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260B	ND		10	0.29	ug/L	1
Methylene chloride	75-09-2	8260B	ND		1.0	0.42	ug/L	1
Styrene	100-42-5	8260B	ND		1.0	0.13	ug/L	1
1,1,1,2-Tetrachloroethane	630-20-6	8260B	ND		1.0	0.19	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260B	ND		1.0	0.13	ug/L	1
Tetrachloroethene	127-18-4	8260B	ND		1.0	0.22	ug/L	1
Toluene	108-88-3	8260B	ND		1.0	0.24	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260B	ND		1.0	0.24	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260B	ND		1.0	0.22	ug/L	1
Trichloroethene	79-01-6	8260B	ND		1.0	0.16	ug/L	1
Trichlorofluoromethane	75-69-4	8260B	ND		1.0	0.74	ug/L	1
1,2,3-Trichloropropane	96-18-4	8260B	ND		1.0	0.35	ug/L	1

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

Volatile Organic Compounds by GC/MS

Client: **Buxton Environmental**
Description: **TRIP BLANK(SH2271)**
Date Sampled: **08/12/2015**
Date Received: **08/13/2015**

Laboratory ID: **QH13039-014**
Matrix: **Aqueous**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260B	1	08/19/2015 1256	PAP		82792

Parameter	CAS Number	Analytical Method	Result	Q	PQL	MDL	Units	Run
Vinyl acetate	108-05-4	8260B	ND		5.0	1.0	ug/L	1
Vinyl chloride	75-01-4	8260B	ND		1.0	0.50	ug/L	1
Xylenes (total)	1330-20-7	8260B	ND		1.0	0.32	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		79	70-130
Bromofluorobenzene		110	70-130
Toluene-d8		90	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
B = Detected in the method blank
J = Estimated result < PQL and ≥ MDL
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
H = Out of holding time
N = Recovery is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

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QC Summary

Inorganic non-metals - MB

Sample ID: QQ82528-001
Batch: 82528
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TDS	6.0	J	1	10	3.4	mg/L	08/17/2015 1038

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ82528-002
Batch: 82528
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TDS	1500	1500		1	97	90-110	08/17/2015 1038

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - Duplicate

Sample ID: QH13039-012DU
Batch: 82528
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Result (mg/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
TDS	ND	ND		1	0.00	20	08/17/2015 1038

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ82708-001
Batch: 82708
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TDS	ND		1	10	3.4	mg/L	08/18/2015 1930

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ82708-002
Batch: 82708
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TDS	1500	1400		1	95	90-110	08/18/2015 1930

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ82773-001
Batch: 82773
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
TDS	9.0	J	1	10	3.4	mg/L	08/19/2015 1103

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ82773-002
Batch: 82773
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
TDS	1500	1500		1	99	90-110	08/19/2015 1103

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - Duplicate

Sample ID: QH13039-006DU
Batch: 82773
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Result (mg/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
TDS	680	680		1	0.73	20	08/19/2015 1103

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - Duplicate

Sample ID: QH13039-007DU
Batch: 82773
Analytical Method: SM 2540C-2011

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Result (mg/L)	Q	Dil	% RPD	% RPD Limit	Analysis Date
TDS	1100	1100		1	2.7	20	08/19/2015 1103

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ83809-001
Batch: 83809
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Chloride	ND		1	1.0	0.11	mg/L	08/31/2015 0021

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ83809-002
Batch: 83809
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Chloride	20	20		1	100	90-110	08/30/2015 2357

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ83816-001
Batch: 83816
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Fluoride	ND		1	0.10	0.041	mg/L	08/31/2015 0021

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ83816-002
Batch: 83816
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Fluoride	4.0	4.2		1	106	90-110	08/30/2015 2357

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ83818-001
Batch: 83818
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Sulfate	ND		1	1.0	0.28	mg/L	08/31/2015 0021

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ83818-002
Batch: 83818
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	20	21		1	103	90-110	08/30/2015 2357

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ83979-001
Batch: 83979
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Fluoride	ND		1	0.10	0.041	mg/L	09/01/2015 1618

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ83979-002
Batch: 83979
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Fluoride	4.0	4.2		1	105	90-110	09/01/2015 1642

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: QH13039-005MS
Batch: 83979
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Fluoride	0.74	4.0	4.7		1	100	90-110	09/01/2015 1815

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: QH13039-005MD
Batch: 83979
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Fluoride	0.74	4.0	4.8		1	102	1.5	90-110	20	09/01/2015 1838

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ83981-001
Batch: 83981
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Chloride	ND		1	1.0	0.11	mg/L	09/01/2015 1618

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ83981-002
Batch: 83981
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Chloride	20	20		1	98	90-110	09/01/2015 1642

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria
Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: QH13039-005MS
Batch: 83981
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Chloride	22	20	41		1	96	90-110	09/01/2015 1815

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: QH13039-005MD
Batch: 83981
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Chloride	22	20	41		1	96	0.42	90-110	20	09/01/2015 1838

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MB

Sample ID: QQ83986-001
Batch: 83986
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Sulfate	ND		1	1.0	0.28	mg/L	09/01/2015 1618

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - LCS

Sample ID: QQ83986-002
Batch: 83986
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	20	20		1	98	90-110	09/01/2015 1642

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MS

Sample ID: QH13039-005MS
Batch: 83986
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Sulfate	4.1	20	23		1	94	90-110	09/01/2015 1815

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Inorganic non-metals - MSD

Sample ID: QH13039-005MD
Batch: 83986
Analytical Method: 300.0

Matrix: Aqueous

Parameter	Sample Amount (mg/L)	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Sulfate	4.1	20	23		1	95	1.2	90-110	20	09/01/2015 1838

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: QQ82615-001
Batch: 82615
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	1.6	ug/L	08/18/2015 0942
Acrylonitrile	ND		1	20	0.62	ug/L	08/18/2015 0942
Benzene	ND		1	1.0	0.21	ug/L	08/18/2015 0942
Bromochloromethane	ND		1	1.0	0.45	ug/L	08/18/2015 0942
Bromodichloromethane	ND		1	1.0	0.23	ug/L	08/18/2015 0942
Bromoform	ND		1	1.0	0.35	ug/L	08/18/2015 0942
Bromomethane (Methyl bromide)	ND		1	2.0	0.19	ug/L	08/18/2015 0942
2-Butanone (MEK)	ND		1	10	1.8	ug/L	08/18/2015 0942
Carbon disulfide	ND		1	1.0	0.45	ug/L	08/18/2015 0942
Carbon tetrachloride	ND		1	1.0	0.31	ug/L	08/18/2015 0942
Chlorobenzene	ND		1	1.0	0.20	ug/L	08/18/2015 0942
Chloroethane	ND		1	2.0	0.28	ug/L	08/18/2015 0942
Chloroform	ND		1	1.0	0.21	ug/L	08/18/2015 0942
Chloromethane (Methyl chloride)	ND		1	1.0	0.19	ug/L	08/18/2015 0942
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	1.0	0.57	ug/L	08/18/2015 0942
Dibromochloromethane	ND		1	1.0	0.23	ug/L	08/18/2015 0942
1,2-Dibromoethane (EDB)	ND		1	1.0	0.17	ug/L	08/18/2015 0942
Dibromomethane (Methylene bromide)	ND		1	1.0	0.26	ug/L	08/18/2015 0942
trans-1,4-Dichloro-2-butene	ND		1	2.0	1.4	ug/L	08/18/2015 0942
1,4-Dichlorobenzene	ND		1	1.0	0.19	ug/L	08/18/2015 0942
1,2-Dichlorobenzene	ND		1	1.0	0.46	ug/L	08/18/2015 0942
1,2-Dichloroethane	ND		1	1.0	0.23	ug/L	08/18/2015 0942
1,1-Dichloroethane	ND		1	1.0	0.19	ug/L	08/18/2015 0942
cis-1,2-Dichloroethene	ND		1	1.0	0.20	ug/L	08/18/2015 0942
1,1-Dichloroethene	ND		1	1.0	0.31	ug/L	08/18/2015 0942
trans-1,2-Dichloroethene	ND		1	1.0	0.33	ug/L	08/18/2015 0942
1,2-Dichloropropane	ND		1	1.0	0.29	ug/L	08/18/2015 0942
cis-1,3-Dichloropropene	ND		1	1.0	0.30	ug/L	08/18/2015 0942
trans-1,3-Dichloropropene	ND		1	1.0	0.22	ug/L	08/18/2015 0942
Ethylbenzene	ND		1	1.0	0.21	ug/L	08/18/2015 0942
2-Hexanone	ND		1	10	0.26	ug/L	08/18/2015 0942
Methyl iodide (Iodomethane)	ND		1	5.0	0.28	ug/L	08/18/2015 0942
4-Methyl-2-pentanone	ND		1	10	0.29	ug/L	08/18/2015 0942
Methylene chloride	ND		1	1.0	0.42	ug/L	08/18/2015 0942
Styrene	ND		1	1.0	0.13	ug/L	08/18/2015 0942
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.13	ug/L	08/18/2015 0942
1,1,1,2-Tetrachloroethane	ND		1	1.0	0.19	ug/L	08/18/2015 0942
Tetrachloroethene	ND		1	1.0	0.22	ug/L	08/18/2015 0942
Toluene	ND		1	1.0	0.24	ug/L	08/18/2015 0942
1,1,1-Trichloroethane	ND		1	1.0	0.24	ug/L	08/18/2015 0942
1,1,2-Trichloroethane	ND		1	1.0	0.22	ug/L	08/18/2015 0942
Trichloroethene	ND		1	1.0	0.16	ug/L	08/18/2015 0942
Trichlorofluoromethane	ND		1	1.0	0.74	ug/L	08/18/2015 0942
1,2,3-Trichloropropane	ND		1	1.0	0.35	ug/L	08/18/2015 0942

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: QQ82615-001
Batch: 82615
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Vinyl acetate	ND		1	5.0	1.0	ug/L	08/18/2015 0942
Vinyl chloride	ND		1	1.0	0.50	ug/L	08/18/2015 0942
Xylenes (total)	ND		1	1.0	0.32	ug/L	08/18/2015 0942

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		99	70-130
1,2-Dichloroethane-d4		103	70-130
Toluene-d8		102	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ82615-002
Batch: 82615
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	73		1	73	60-140	08/18/2015 0840
Acrylonitrile	100	82		1	82	70-130	08/18/2015 0840
Benzene	50	51		1	101	70-130	08/18/2015 0840
Bromochloromethane	50	47		1	94	70-130	08/18/2015 0840
Bromodichloromethane	50	51		1	101	70-130	08/18/2015 0840
Bromoform	50	53		1	105	70-130	08/18/2015 0840
Bromomethane (Methyl bromide)	50	50		1	101	60-140	08/18/2015 0840
2-Butanone (MEK)	100	93		1	93	60-140	08/18/2015 0840
Carbon disulfide	50	51		1	103	60-140	08/18/2015 0840
Carbon tetrachloride	50	53		1	106	70-130	08/18/2015 0840
Chlorobenzene	50	51		1	102	70-130	08/18/2015 0840
Chloroethane	50	54		1	108	60-140	08/18/2015 0840
Chloroform	50	44		1	88	70-130	08/18/2015 0840
Chloromethane (Methyl chloride)	50	50		1	100	60-140	08/18/2015 0840
1,2-Dibromo-3-chloropropane (DBCP)	50	45		1	91	70-130	08/18/2015 0840
Dibromochloromethane	50	54		1	108	70-130	08/18/2015 0840
1,2-Dibromoethane (EDB)	50	50		1	100	70-130	08/18/2015 0840
Dibromomethane (Methylene bromide)	50	50		1	100	70-130	08/18/2015 0840
trans-1,4-Dichloro-2-butene	50	56		1	111	34-142	08/18/2015 0840
1,4-Dichlorobenzene	50	51		1	102	70-130	08/18/2015 0840
1,2-Dichlorobenzene	50	49		1	98	70-130	08/18/2015 0840
1,2-Dichloroethane	50	49		1	98	70-130	08/18/2015 0840
1,1-Dichloroethane	50	49		1	98	70-130	08/18/2015 0840
cis-1,2-Dichloroethene	50	49		1	99	70-130	08/18/2015 0840
1,1-Dichloroethene	50	51		1	102	70-130	08/18/2015 0840
trans-1,2-Dichloroethene	50	51		1	101	70-130	08/18/2015 0840
1,2-Dichloropropane	50	47		1	95	70-130	08/18/2015 0840
cis-1,3-Dichloropropene	50	54		1	107	70-130	08/18/2015 0840
trans-1,3-Dichloropropene	50	55		1	109	70-130	08/18/2015 0840
Ethylbenzene	50	51		1	102	70-130	08/18/2015 0840
2-Hexanone	100	100		1	101	60-140	08/18/2015 0840
Methyl iodide (Iodomethane)	50	52		1	104	70-130	08/18/2015 0840
4-Methyl-2-pentanone	100	97		1	97	60-140	08/18/2015 0840
Methylene chloride	50	48		1	96	70-130	08/18/2015 0840
Styrene	50	52		1	104	70-130	08/18/2015 0840
1,1,2,2-Tetrachloroethane	50	49		1	97	60-140	08/18/2015 0840
1,1,1,2-Tetrachloroethane	50	51		1	102	70-130	08/18/2015 0840
Tetrachloroethene	50	53		1	106	70-130	08/18/2015 0840
Toluene	50	52		1	105	70-130	08/18/2015 0840
1,1,1-Trichloroethane	50	51		1	103	70-130	08/18/2015 0840
1,1,2-Trichloroethane	50	52		1	103	70-130	08/18/2015 0840
Trichloroethene	50	50		1	101	70-130	08/18/2015 0840
Trichlorofluoromethane	50	54		1	109	70-130	08/18/2015 0840
1,2,3-Trichloropropane	50	47		1	94	70-130	08/18/2015 0840

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ82615-002
Batch: 82615
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Vinyl acetate	50	48		1	95	60-140	08/18/2015 0840
Vinyl chloride	50	51		1	102	70-130	08/18/2015 0840
Xylenes (total)	100	100		1	103	70-130	08/18/2015 0840

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		101	70-130
1,2-Dichloroethane-d4		94	70-130
Toluene-d8		109	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: QQ82792-001
Batch: 82792
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Acetone	ND		1	20	1.6	ug/L	08/19/2015 1006
Acrylonitrile	ND		1	20	0.62	ug/L	08/19/2015 1006
Benzene	ND		1	1.0	0.21	ug/L	08/19/2015 1006
Bromochloromethane	ND		1	1.0	0.45	ug/L	08/19/2015 1006
Bromodichloromethane	ND		1	1.0	0.23	ug/L	08/19/2015 1006
Bromoform	ND		1	1.0	0.35	ug/L	08/19/2015 1006
Bromomethane (Methyl bromide)	ND		1	2.0	0.19	ug/L	08/19/2015 1006
2-Butanone (MEK)	ND		1	10	1.8	ug/L	08/19/2015 1006
Carbon disulfide	ND		1	1.0	0.45	ug/L	08/19/2015 1006
Carbon tetrachloride	ND		1	1.0	0.31	ug/L	08/19/2015 1006
Chlorobenzene	ND		1	1.0	0.20	ug/L	08/19/2015 1006
Chloroethane	ND		1	2.0	0.28	ug/L	08/19/2015 1006
Chloroform	ND		1	1.0	0.21	ug/L	08/19/2015 1006
Chloromethane (Methyl chloride)	ND		1	1.0	0.19	ug/L	08/19/2015 1006
1,2-Dibromo-3-chloropropane (DBCP)	ND		1	1.0	0.57	ug/L	08/19/2015 1006
Dibromochloromethane	ND		1	1.0	0.23	ug/L	08/19/2015 1006
1,2-Dibromoethane (EDB)	ND		1	1.0	0.17	ug/L	08/19/2015 1006
Dibromomethane (Methylene bromide)	ND		1	1.0	0.26	ug/L	08/19/2015 1006
trans-1,4-Dichloro-2-butene	ND		1	2.0	1.4	ug/L	08/19/2015 1006
1,4-Dichlorobenzene	ND		1	1.0	0.19	ug/L	08/19/2015 1006
1,2-Dichlorobenzene	ND		1	1.0	0.46	ug/L	08/19/2015 1006
1,2-Dichloroethane	ND		1	1.0	0.23	ug/L	08/19/2015 1006
1,1-Dichloroethane	ND		1	1.0	0.19	ug/L	08/19/2015 1006
1,1-Dichloroethene	ND		1	1.0	0.31	ug/L	08/19/2015 1006
trans-1,2-Dichloroethene	ND		1	1.0	0.33	ug/L	08/19/2015 1006
cis-1,2-Dichloroethene	ND		1	1.0	0.20	ug/L	08/19/2015 1006
1,2-Dichloropropane	ND		1	1.0	0.29	ug/L	08/19/2015 1006
cis-1,3-Dichloropropene	ND		1	1.0	0.30	ug/L	08/19/2015 1006
trans-1,3-Dichloropropene	ND		1	1.0	0.22	ug/L	08/19/2015 1006
Ethylbenzene	ND		1	1.0	0.21	ug/L	08/19/2015 1006
2-Hexanone	ND		1	10	0.26	ug/L	08/19/2015 1006
Methyl iodide (Iodomethane)	ND		1	5.0	0.28	ug/L	08/19/2015 1006
4-Methyl-2-pentanone	ND		1	10	0.29	ug/L	08/19/2015 1006
Methylene chloride	ND		1	1.0	0.42	ug/L	08/19/2015 1006
Styrene	ND		1	1.0	0.13	ug/L	08/19/2015 1006
1,1,1,2-Tetrachloroethane	ND		1	1.0	0.19	ug/L	08/19/2015 1006
1,1,2,2-Tetrachloroethane	ND		1	1.0	0.13	ug/L	08/19/2015 1006
Tetrachloroethene	ND		1	1.0	0.22	ug/L	08/19/2015 1006
Toluene	ND		1	1.0	0.24	ug/L	08/19/2015 1006
1,1,1-Trichloroethane	ND		1	1.0	0.24	ug/L	08/19/2015 1006
1,1,2-Trichloroethane	ND		1	1.0	0.22	ug/L	08/19/2015 1006
Trichloroethene	ND		1	1.0	0.16	ug/L	08/19/2015 1006
Trichlorofluoromethane	ND		1	1.0	0.74	ug/L	08/19/2015 1006
1,2,3-Trichloropropane	ND		1	1.0	0.35	ug/L	08/19/2015 1006

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: QQ82792-001
Batch: 82792
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Vinyl acetate	ND		1	5.0	1.0	ug/L	08/19/2015 1006
Vinyl chloride	ND		1	1.0	0.50	ug/L	08/19/2015 1006
Xylenes (total)	ND		1	1.0	0.32	ug/L	08/19/2015 1006

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		108	70-130
1,2-Dichloroethane-d4		78	70-130
Toluene-d8		90	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ82792-002
Batch: 82792
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Acetone	100	100		1	104	60-140	08/19/2015 0902
Acrylonitrile	100	110		1	111	70-130	08/19/2015 0902
Benzene	50	53		1	106	70-130	08/19/2015 0902
Bromochloromethane	50	55		1	109	70-130	08/19/2015 0902
Bromodichloromethane	50	52		1	104	70-130	08/19/2015 0902
Bromoform	50	52		1	104	70-130	08/19/2015 0902
Bromomethane (Methyl bromide)	50	55		1	110	60-140	08/19/2015 0902
2-Butanone (MEK)	100	110		1	109	60-140	08/19/2015 0902
Carbon disulfide	50	62		1	123	60-140	08/19/2015 0902
Carbon tetrachloride	50	58		1	115	70-130	08/19/2015 0902
Chlorobenzene	50	53		1	105	70-130	08/19/2015 0902
Chloroethane	50	53		1	106	60-140	08/19/2015 0902
Chloroform	50	51		1	102	70-130	08/19/2015 0902
Chloromethane (Methyl chloride)	50	55		1	111	60-140	08/19/2015 0902
1,2-Dibromo-3-chloropropane (DBCP)	50	46		1	93	70-130	08/19/2015 0902
Dibromochloromethane	50	52		1	103	70-130	08/19/2015 0902
1,2-Dibromoethane (EDB)	50	52		1	104	70-130	08/19/2015 0902
Dibromomethane (Methylene bromide)	50	51		1	101	70-130	08/19/2015 0902
trans-1,4-Dichloro-2-butene	50	48		1	97	34-142	08/19/2015 0902
1,4-Dichlorobenzene	50	52		1	103	70-130	08/19/2015 0902
1,2-Dichlorobenzene	50	54		1	108	70-130	08/19/2015 0902
1,2-Dichloroethane	50	53		1	107	70-130	08/19/2015 0902
1,1-Dichloroethane	50	54		1	108	70-130	08/19/2015 0902
1,1-Dichloroethene	50	57		1	113	70-130	08/19/2015 0902
trans-1,2-Dichloroethene	50	55		1	111	70-130	08/19/2015 0902
cis-1,2-Dichloroethene	50	55		1	110	70-130	08/19/2015 0902
1,2-Dichloropropane	50	52		1	103	70-130	08/19/2015 0902
cis-1,3-Dichloropropene	50	52		1	105	70-130	08/19/2015 0902
trans-1,3-Dichloropropene	50	51		1	103	70-130	08/19/2015 0902
Ethylbenzene	50	53		1	106	70-130	08/19/2015 0902
2-Hexanone	100	100		1	102	60-140	08/19/2015 0902
Methyl iodide (Iodomethane)	50	57		1	113	70-130	08/19/2015 0902
4-Methyl-2-pentanone	100	100		1	102	60-140	08/19/2015 0902
Methylene chloride	50	52		1	105	70-130	08/19/2015 0902
Styrene	50	53		1	106	70-130	08/19/2015 0902
1,1,1,2-Tetrachloroethane	50	52		1	104	70-130	08/19/2015 0902
1,1,2,2-Tetrachloroethane	50	51		1	102	60-140	08/19/2015 0902
Tetrachloroethene	50	52		1	104	70-130	08/19/2015 0902
Toluene	50	53		1	107	70-130	08/19/2015 0902
1,1,1-Trichloroethane	50	56		1	112	70-130	08/19/2015 0902
1,1,2-Trichloroethane	50	51		1	103	70-130	08/19/2015 0902
Trichloroethene	50	54		1	108	70-130	08/19/2015 0902
Trichlorofluoromethane	50	55		1	110	70-130	08/19/2015 0902
1,2,3-Trichloropropane	50	51		1	102	70-130	08/19/2015 0902

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: QQ82792-002
Batch: 82792
Analytical Method: 8260B

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Vinyl acetate	50	54		1	109	60-140	08/19/2015 0902
Vinyl chloride	50	55		1	109	70-130	08/19/2015 0902
Xylenes (total)	100	110		1	106	70-130	08/19/2015 0902

Surrogate	Q	% Rec	Acceptance Limit
Bromofluorobenzene		108	70-130
1,2-Dichloroethane-d4		75	70-130
Toluene-d8		92	70-130

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MB

Sample ID: QQ82380-001
Batch: 82380
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 939

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Antimony	ND		1	1.0	0.17	ug/L	08/15/2015 0304
Arsenic	ND		1	1.0	0.26	ug/L	08/15/2015 0304
Barium	ND		1	5.0	0.53	ug/L	08/15/2015 0304
Beryllium	ND		1	0.40	0.12	ug/L	08/15/2015 0304
Boron	ND		1	25	0.57	ug/L	08/15/2015 0304
Cadmium	ND		1	0.10	0.044	ug/L	08/15/2015 0304
Calcium	**43**	**J**	**1**	**200**	**11**	**ug/L**	**08/15/2015 0304**
Chromium	ND		1	5.0	0.63	ug/L	08/15/2015 0304
Cobalt	ND		1	5.0	0.26	ug/L	08/15/2015 0304
Copper	**0.20**	**J**	**1**	**1.0**	**0.15**	**ug/L**	**08/15/2015 0304**
Lead	ND		1	1.0	0.15	ug/L	08/15/2015 0304
Molybdenum	ND		1	10	0.51	ug/L	08/15/2015 0304
Nickel	ND		1	5.0	0.63	ug/L	08/15/2015 0304
Selenium	ND		1	1.0	0.95	ug/L	08/15/2015 0304
Silver	ND		1	1.0	0.17	ug/L	08/20/2015 1814
Thallium	ND		1	0.50	0.075	ug/L	08/15/2015 0304
Vanadium	ND		1	5.0	1.0	ug/L	08/15/2015 0304
Zinc	ND		1	10	1.6	ug/L	08/15/2015 0304

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - LCS

Sample ID: QQ82380-002
Batch: 82380
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 939

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Antimony	100	110		1	106	80-120	08/15/2015 0310
Arsenic	100	100		1	101	80-120	08/15/2015 0310
Barium	100	100		1	104	80-120	08/15/2015 0310
Beryllium	100	100		1	102	80-120	08/15/2015 0310
Boron	100	99		1	99	80-120	08/15/2015 0310
Cadmium	100	100		1	101	80-120	08/15/2015 0310
Calcium	1000	1100		1	110	80-120	08/15/2015 0310
Chromium	100	100		1	103	80-120	08/15/2015 0310
Cobalt	100	100		1	101	80-120	08/15/2015 0310
Copper	100	110		1	105	80-120	08/15/2015 0310
Lead	100	100		1	101	80-120	08/15/2015 0310
Molybdenum	100	100		1	104	80-120	08/15/2015 0310
Nickel	100	100		1	103	80-120	08/15/2015 0310
Selenium	100	100		1	100	80-120	08/15/2015 0310
Silver	100	120		1	117	80-120	08/20/2015 1819
Thallium	100	100		1	100	80-120	08/15/2015 0310
Vanadium	100	100		1	101	80-120	08/15/2015 0310
Zinc	100	100		1	103	80-120	08/15/2015 0310

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MS

Sample ID: QH13039-001MS
Batch: 82380
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 939

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Antimony	0.23	100	100		1	102	70-130	08/15/2015 0525
Arsenic	2.8	100	97		1	94	70-130	08/15/2015 0525
Barium	220	100	330		1	113	70-130	08/15/2015 0525
Beryllium	ND	100	88		1	88	70-130	08/15/2015 0525
Boron	6.9	100	100		1	93	70-130	08/15/2015 0525
Cadmium	0.13	100	94		1	94	70-130	08/15/2015 0525
Calcium	150000	1000	150000	N	1	220	70-130	08/15/2015 0525
Chromium	0.92	100	100		1	99	70-130	08/15/2015 0525
Cobalt	0.35	100	95		1	95	70-130	08/15/2015 0525
Copper	0.87	100	92		1	91	70-130	08/15/2015 0525
Lead	0.34	100	96		1	96	70-130	08/15/2015 0525
Molybdenum	0.95	100	110		1	105	70-130	08/15/2015 0525
Nickel	2.5	100	95		1	92	70-130	08/15/2015 0525
Selenium	8.1	100	96		1	88	70-130	08/15/2015 0525
Silver	0.50	100	110		1	105	70-130	08/20/2015 1828
Thallium	ND	100	110		1	107	70-130	08/15/2015 0525
Vanadium	2.7	100	100		1	100	70-130	08/15/2015 0525
Zinc	6.3	100	90		1	84	70-130	08/15/2015 0525

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MSD

Sample ID: QH13039-001MD
Batch: 82380
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 939

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Antimony	0.23	100	100		1	103	0.58	70-130	20	08/15/2015 0531
Arsenic	2.8	100	99		1	96	2.1	70-130	20	08/15/2015 0531
Barium	220	100	330		1	109	1.3	70-130	20	08/15/2015 0531
Beryllium	ND	100	88		1	88	0.080	70-130	20	08/15/2015 0531
Boron	6.9	100	100		1	93	0.87	70-130	20	08/15/2015 0531
Cadmium	0.13	100	94		1	94	0.085	70-130	20	08/15/2015 0531
Calcium	150000	1000	150000	N	1	210	0.068	70-130	20	08/15/2015 0531
Chromium	0.92	100	100		1	100	0.50	70-130	20	08/15/2015 0531
Cobalt	0.35	100	96		1	96	1.4	70-130	20	08/15/2015 0531
Copper	0.87	100	92		1	91	0.011	70-130	20	08/15/2015 0531
Lead	0.34	100	97		1	96	0.23	70-130	20	08/15/2015 0531
Molybdenum	0.95	100	110		1	106	1.0	70-130	20	08/15/2015 0531
Nickel	2.5	100	97		1	94	1.9	70-130	20	08/15/2015 0531
Selenium	8.1	100	97		1	89	1.2	70-130	20	08/15/2015 0531
Silver	0.50	100	110		1	107	2.2	70-130	20	08/20/2015 1833
Thallium	ND	100	110		1	109	1.9	70-130	20	08/15/2015 0531
Vanadium	2.7	100	100		1	101	1.1	70-130	20	08/15/2015 0531
Zinc	6.3	100	92		1	86	2.1	70-130	20	08/15/2015 0531

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MB

Sample ID: QQ82426-001
Batch: 82426
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 1445

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Antimony	ND		1	1.0	0.17	ug/L	08/15/2015 0552
Arsenic	ND		1	1.0	0.26	ug/L	08/15/2015 0552
Barium	ND		1	5.0	0.53	ug/L	08/15/2015 0552
Beryllium	ND		1	0.40	0.12	ug/L	08/15/2015 0552
Boron	ND		1	25	0.57	ug/L	08/20/2015 1852
Cadmium	ND		1	0.10	0.044	ug/L	08/15/2015 0552
Calcium	**51**	**J**	**1**	**200**	**11**	**ug/L**	**08/15/2015 0552**
Chromium	ND		1	5.0	0.63	ug/L	08/15/2015 0552
Cobalt	ND		1	5.0	0.26	ug/L	08/15/2015 0552
Copper	**0.16**	**J**	**1**	**1.0**	**0.15**	**ug/L**	**08/15/2015 0552**
Lead	ND		1	1.0	0.15	ug/L	08/15/2015 0552
Molybdenum	ND		1	10	0.51	ug/L	08/15/2015 0552
Nickel	ND		1	5.0	0.63	ug/L	08/15/2015 0552
Selenium	ND		1	1.0	0.95	ug/L	08/15/2015 0552
Silver	**0.22**	**J**	**1**	**1.0**	**0.17**	**ug/L**	**08/19/2015 0245**
Thallium	ND		1	0.50	0.075	ug/L	08/15/2015 0552
Vanadium	ND		1	5.0	1.0	ug/L	08/15/2015 0552
Zinc	ND		1	10	1.6	ug/L	08/15/2015 0552

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - LCS

Sample ID: QQ82426-002
Batch: 82426
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 1445

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Antimony	100	110		1	107	80-120	08/15/2015 0558
Arsenic	100	100		1	104	80-120	08/15/2015 0558
Barium	100	110		1	106	80-120	08/15/2015 0558
Beryllium	100	100		1	104	80-120	08/15/2015 0558
Boron	100	110		1	107	80-120	08/20/2015 1857
Cadmium	100	100		1	101	80-120	08/15/2015 0558
Calcium	1000	1100		1	114	80-120	08/15/2015 0558
Chromium	100	100		1	103	80-120	08/15/2015 0558
Cobalt	100	100		1	102	80-120	08/15/2015 0558
Copper	100	110		1	105	80-120	08/15/2015 0558
Lead	100	100		1	102	80-120	08/15/2015 0558
Molybdenum	100	100		1	104	80-120	08/15/2015 0558
Nickel	100	100		1	104	80-120	08/15/2015 0558
Selenium	100	110		1	108	80-120	08/15/2015 0558
Silver	100	120		1	115	80-120	08/19/2015 0250
Thallium	100	100		1	101	80-120	08/15/2015 0558
Vanadium	100	100		1	103	80-120	08/15/2015 0558
Zinc	100	100		1	105	80-120	08/15/2015 0558

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MS

Sample ID: QH13039-002MS
Batch: 82426
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 1445

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Antimony	0.49	100	100		1	101	70-130	08/19/2015 0439
Arsenic	3.2	100	100		1	97	70-130	08/15/2015 0747
Barium	260	100	380		1	121	70-130	08/15/2015 0747
Beryllium	0.17	100	93		1	93	70-130	08/15/2015 0747
Boron	36	100	140		1	104	70-130	08/20/2015 1906
Cadmium	0.060	100	100		1	100	70-130	08/19/2015 0439
Calcium	97000	1000	97000	N	1	23	70-130	08/15/2015 0747
Chromium	5.2	100	110		1	101	70-130	08/15/2015 0747
Cobalt	1.6	100	100		1	98	70-130	08/15/2015 0747
Copper	4.1	100	97		1	93	70-130	08/15/2015 0747
Lead	2.0	100	100		1	102	70-130	08/15/2015 0747
Molybdenum	11	100	120		1	105	70-130	08/15/2015 0747
Nickel	5.4	100	100		1	95	70-130	08/15/2015 0747
Selenium	7.7	100	100		1	94	70-130	08/15/2015 0747
Silver	ND	100	110		1	110	70-130	08/20/2015 1906
Thallium	ND	100	110		1	113	70-130	08/15/2015 0747
Vanadium	4.8	100	110		1	104	70-130	08/15/2015 0747
Zinc	12	100	100		1	88	70-130	08/15/2015 0747

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MSD

Sample ID: QH13039-002MD
Batch 82426
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/14/2015 1445

Parameter	Sample Amount (ug/L)	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	% Rec Limit	% RPD Limit	Analysis Date
Antimony	0.49	100	100		1	102	0.89	70-130	20	08/19/2015 0455
Arsenic	3.2	100	100		1	97	0.26	70-130	20	08/15/2015 0803
Barium	260	100	380		1	114	1.8	70-130	20	08/15/2015 0803
Beryllium	0.17	100	93		1	92	0.44	70-130	20	08/15/2015 0803
Boron	36	100	140		1	99	3.2	70-130	20	08/20/2015 1911
Cadmium	0.060	100	99		1	99	0.77	70-130	20	08/19/2015 0455
Calcium	97000	1000	96000	N	1	-104	1.3	70-130	20	08/15/2015 0803
Chromium	5.2	100	110		1	104	2.2	70-130	20	08/15/2015 0803
Cobalt	1.6	100	99		1	98	0.54	70-130	20	08/15/2015 0803
Copper	4.1	100	97		1	93	0.44	70-130	20	08/15/2015 0803
Lead	2.0	100	100		1	99	3.3	70-130	20	08/15/2015 0803
Molybdenum	11	100	120		1	106	0.60	70-130	20	08/15/2015 0803
Nickel	5.4	100	100		1	95	0.60	70-130	20	08/15/2015 0803
Selenium	7.7	100	100		1	93	0.30	70-130	20	08/15/2015 0803
Silver	ND	100	110		1	109	0.55	70-130	20	08/20/2015 1911
Thallium	ND	100	110		1	113	0.62	70-130	20	08/15/2015 0803
Vanadium	4.8	100	110		1	105	1.0	70-130	20	08/15/2015 0803
Zinc	12	100	100		1	89	0.95	70-130	20	08/15/2015 0803

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - MB

Sample ID: QQ82603-001
Batch: 82603
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/18/2015 1130

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Antimony	ND		1	1.0	0.17	ug/L	08/19/2015 0030
Arsenic	ND		1	1.0	0.26	ug/L	08/20/2015 1944
Barium	ND		1	5.0	0.53	ug/L	08/19/2015 0030
Beryllium	ND		1	0.40	0.12	ug/L	08/19/2015 0030
Boron	ND		1	25	0.57	ug/L	08/20/2015 1944
Cadmium	ND		1	0.10	0.044	ug/L	08/19/2015 0030
Calcium	**41**	**J**	**1**	**200**	**11**	**ug/L**	**08/19/2015 0030**
Chromium	ND		1	5.0	0.63	ug/L	08/19/2015 0030
Cobalt	ND		1	5.0	0.26	ug/L	08/19/2015 0030
Copper	**0.41**	**J**	**1**	**1.0**	**0.15**	**ug/L**	**08/19/2015 0030**
Lead	ND		1	1.0	0.15	ug/L	08/19/2015 0030
Molybdenum	ND		1	10	0.51	ug/L	08/19/2015 0030
Nickel	ND		1	5.0	0.63	ug/L	08/19/2015 0030
Selenium	ND		1	1.0	0.95	ug/L	08/20/2015 1944
Silver	ND		1	1.0	0.17	ug/L	08/22/2015 0022
Thallium	ND		1	0.50	0.075	ug/L	08/19/2015 0030
Vanadium	ND		1	5.0	1.0	ug/L	08/19/2015 0030
Zinc	ND		1	10	1.6	ug/L	08/19/2015 0030

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

ICP-MS - LCS

Sample ID: QQ82603-002
Batch: 82603
Analytical Method: 6020A

Matrix: Aqueous
Prep Method: 3005A
Prep Date: 08/18/2015 1130

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Antimony	100	110		1	106	80-120	08/19/2015 0035
Arsenic	100	110		1	108	80-120	08/20/2015 1949
Barium	100	110		1	108	80-120	08/19/2015 0035
Beryllium	100	110		1	110	80-120	08/19/2015 0035
Boron	100	110		1	106	80-120	08/20/2015 1949
Cadmium	100	100		1	101	80-120	08/19/2015 0035
Calcium	1000	1100		1	115	80-120	08/19/2015 0035
Chromium	100	110		1	106	80-120	08/19/2015 0035
Cobalt	100	110		1	108	80-120	08/19/2015 0035
Copper	100	110		1	107	80-120	08/19/2015 0035
Lead	100	98		1	98	80-120	08/19/2015 0035
Molybdenum	100	110		1	107	80-120	08/19/2015 0035
Nickel	100	110		1	106	80-120	08/19/2015 0035
Selenium	100	110		1	107	80-120	08/20/2015 1949
Silver	100	120		1	116	80-120	08/22/2015 0027
Thallium	100	100		1	102	80-120	08/19/2015 0035
Vanadium	100	100		1	104	80-120	08/19/2015 0035
Zinc	100	110		1	106	80-120	08/19/2015 0035

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

CVAA - MB

Sample ID: QQ82565-001
Batch: 82565
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 08/17/2015 1647

Parameter	Result	Q	Dil	PQL	MDL	Units	Analysis Date
Mercury	ND		1	0.00010	0.000028	mg/L	08/18/2015 0940

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

CVAA - LCS

Sample ID: QQ82565-002
Batch: 82565
Analytical Method: 7470A

Matrix: Aqueous
Prep Method: 7470A
Prep Date: 08/17/2015 1647

Parameter	Spike Amount (mg/L)	Result (mg/L)	Q	Dil	% Rec	% Rec Limit	Analysis Date
Mercury	0.0020	0.0020		1	102	80-120	08/18/2015 0942

PQL = Practical quantitation limit
ND = Not detected at or above the MDL
P = The RPD between two GC columns exceeds 40%
J = Estimated result < PQL and ≥ MDL
N = Recovery is out of criteria
+ = RPD is out of criteria

Where applicable, all soil sample analysis are reported on a dry weight basis unless flagged with a "W"

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

SHEALY Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111

Number 110670

Client: BUXTON ENVIRONMENTAL INC
Report to Contact: ROSS KLEINMAN
Telephone No. / Fax No. / E-mail: 704-344-1458
Quote No.: 17864
Address: 1101 SOUTH BLVD, STE 101
Sampler's Signature:
Waybill No.:
Page 1 of 1
City: CHARLOTTE | State: NC | Zip Code: 28203
Printed Name:
Remarks (Attach list if more space is needed.)
Project Name: BRICKHAVEN NO.2 MINE TRACT "A"
Project No.: 1271 MONCURE - FLATWOOD RD MONCURE, NC
P.O. No.:

QH13039

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	Grab (G) Composite (C)	Matrix: Aqueous	Solid	Air/Aqueous	Liquids	Aerosol	No. of Containers by Preservative Type: NaOH	HNO3	NaOH	Silica Gel	Unpres.	EPA-APPIII (Boron, Calcium, Chloride, Fluoride, Sulfate + TDS)	EPA-APPIII (Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, Tl)	RADIUM 226+228	* NC APPE METALS (Sb, Al, As, Ag, V, Zn)	NC APP I VOCS					
MW-1	8-12-15	11:15	G	✓					3	3			1	X	X	X	X	X	X					
MW-2	8-12-15	12:40	G	✓					3	3			1	X	X	X	X	X	X					
MW-3	8-12-15	14:10	G	✓					3	3			1	X	X	X	X	X	X					
MW-4	8-12-15	15:20	G	✓					3	3			1	X	X	X	X	X	X					
MW-5	8-12-15	16:25	G	✓					3	3			1	X	X	X	X	X	X					
MW-6	8-12-15	18:30	G	✓					3	3			1	X	X	X	X	X	X					
MW-7	8-12-15	19:30	G	✓					3	3			1	X	X	X	X	X	X					
MW-8	8-12-15	20:40	G	✓					3	3			1	X	X	X	X	X	X					
BG-1	8-12-15	22:10	G	✓					3	3			1	X	X	X	X	X	X					
SW-1	8-13-15	7:45	G	✓					3	3			1	X	X	X	X	X	X					
SW-2	8-13-15	8:30	G	✓					3	3			1	X	X	X	X	X	X					
EQUIPMENT BLANK	8-12-15	9:30	G	✓					3	3			1	X	X	X	X	X	X					
TRIP BLANK	—	—	G	✓						2									X					

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Note: All samples are retained for six weeks from receipt unless other arrangements are made.

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify) 14 DAY TAT

QC Requirements (Specify): EPA + NC [redacted] RULES w/ LOW LEVEL DETECTION & J & B FLAGS (SEE ATTACH LIST OF PARAMETERS)

	Date	Time		Date	Time
1. Relinquished by	8-13-15	1310	1. Received by	8/13/15	1310
2. Relinquished by	8/13/15	1710	2. Received by		
3. Relinquished by			3. Laboratory received by	8/13/15	1710

Comments:

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack
Receipt Temp 4.2 °C
2.9, 2.5, 2.0

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-012 Effective Date: 08-04-02

Shealy Environmental Services, Inc.
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.shealylab.com

SHEALY ENVIRONMENTAL SERVICES, INC.

Shealy Environmental Services, Inc.
Document Number: F-AD-016
Revision Number: 17

Page 1 of 1
Replaces Date: 11/07/14
Effective Date: 04/30/15

Sample Receipt Checklist (SRC)

Client: Buxton Cooler Inspected by/date: mcm/021315 Lot #: QH13039

Means of receipt: ☑ SESI ☐ Client ☐ UPS ☐ FedEx ☐ Airborne Exp ☐ Other

Yes ☐	No ☑		1. Were custody seals present on the cooler?
Yes ☐	No ☐	NA ☑	2. If custody seals were present, were they intact and unbroken?

Cooler ID/Original temperature upon receipt/Derived (corrected) temperature upon receipt:
M12/4.2/4.2 °C /29 /29 °C 2020/2.5/2.5 °C 2271/2.0/2.0 °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0.0 °C

Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None

Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: _____ (For coolers received via commercial courier, PMs are to be notified immediately.)
Yes ☐	No ☐	NA ☑	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐		5. Were proper custody procedures (relinquished/received) followed?
Yes ☐	No ☐	NA ☑	5a Were samples relinquished by client to commercial courier?
Yes ☑	No ☐		6. Were sample IDs listed on the COC?
Yes ☑	No ☐		7. Were sample IDs listed on all sample containers?
Yes ☑	No ☐		8. Was collection date & time listed on the COC?
Yes ☑	No ☐		9. Was collection date & time listed on all sample containers?
mcm 2/13/15 Yes ☑	No ☑		10. Did all container label information (ID, date, time) agree with the COC?
Yes ☑	No ☐		11. Were tests to be performed listed on the COC?
Yes ☑	No ☐		12. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐		13. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐		14. Was adequate sample volume available?
Yes ☑	No ☐		15. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑		16. Were any samples containers missing?
mcm 2/13/15 Yes ☑	No ☑		17. Were there any excess samples not listed on COC?
Yes ☐	No ☑	NA ☐	18. Were bubbles present >"pea-size" (¼"or 6mm in diameter) in any VOA vials?
Yes ☑	No ☐	NA ☐	19. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	20. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	21. Were all applicable NH3/TKN/cyanide/phenol (<0.2mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	22. Were collection temperatures documented on the COC for NC samples?
Yes ☐	No ☐	NA ☑	23. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
Yes ☑	No ☐	12567	24. Was the quote number used taken from the container label?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ (H_2SO_4,HNO_3,HCl,NaOH) using SR # _____.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Sample(s) _____ were received with TRC >0.2 mg/L (If #21 is No)

SC Drinking Water Project Sample(s) pH verified to be > 2 by _____ Date: _____

Sample(s) _____ were not received at a pH of <2 and were adjusted accordingly using SR# _____

Sample labels applied by: mcm Verified by: _____ Date: 2/13/15

Comments:
Received extra set of trip blanks
one of the vials from sample 007 is labeled MW-12
but has correct collection time + date.

(10) The notification of intent to comply with the alternative closure requirements as required by § 257.105(i)(10).

(11) The annual progress reports under the alternative closure requirements as required by § 257.105(i)(11).

(12) The written post-closure plan, and any amendment of the plan, specified under § 257.105(i)(12).

(13) The notification of completion of post-closure care specified under § 257.105(i)(13).

5. Amend part 257 by adding "Appendix III to Part 257" and "Appendix IV to Part 257" to read as follows:

Appendix III to Part 257—Constituents for Detection Monitoring

Common Name[1]
Boron
Calcium
Chloride
Fluoride
pH
Sulfate
Total Dissolved Solids (TDS)

[1] Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

Appendix IV to Part 257—Constituents for Assessment Monitoring

Common Name[1]
Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Fluoride
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 and 228 combined

ADDITIONAL APP I METALL
COPPER
NICKEL
SILVER
VANADIUM
ZINC

+ APP I VOC'S

[1] Common names are those widely used in government regulations, scientific publications, and commerce; synonyms exist for many chemicals.

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

Constituents for Detection Monitoring
(40 CFR 258, Appendix I)

Common name	CAS RN
Antimony	(Total)
Arsenic	(Total)
Barium	(Total)
Beryllium	(Total)
Cadmium	(Total)
Chromium	(Total)
Cobalt	(Total)
Copper	(Total)
Lead	(Total)
Nickel	(Total)
Selenium	(Total)
Silver	(Total)
Thallium	(Total)
Vanadium	(Total)
Zinc	(Total)
Acetone	67-64-1
Acrylonitrile	107-13-1
Benzene	71-43-2
Bromochloromethane	74-97-5
Bromodichloromethane	75-27-4
Bromoform; Tribromomethane	75-25-2
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroethane; Ethyl chloride	75-00-3
Chloroform; Trichloromethane	67-66-3
Dibromochloromethane; Chlorodibromomethane	124-48-1
1,2-Dibromo-3-chlorpropane; DBCP	96-12-8
1,2-Dibromoethane; Ethylene dibromide; EDB	106-93-4
o-Dichlorobenzene; 1,2-Dichlorobenzene	95-50-1
p-Dichlorobenzene; 1,4-Dichlorobenzene	106-46-7
trans-1,4-Dichloro-2-butene	110-57-6
1,1-Dichloroethane; Ethylidene chloride	75-34-3
1,2-Dichloroethane; Ethlyene dichloride	107-06-2
1,1-Dichloroethylene; 1-1-Dichloroethene; Vinylidene chloride	75-35-4
cis-1,2-Dichloroethylene; cis-1,2-Dichloroethene	156-59-2
trans-1,2-Dichloroethylene; trans-1,2-Dichloroethene	156-60-5
1,2-Dichlorpropane; Propylene dichloride	78-87-5
cis-1,3-Dichlorpropene	10061-01-5
trans-1,3-Dichlorpropene	10061-02-6
Ethylbenzene	100-41-4
2-hexanone; Methyl butyl ketone	591-78-6
Methyl bromide; Bromomethane	74-83-9
Methyl chloride; Chloromethane	74-87-3
Methylene bromide Dibromomethane	74-95-3
Methylene chloride; Dichloromethane	75-09-2
Methyl ethyl ketone; MEK; 2-Butanone	78-93-3
Methyl iodide; Iodomethane	74-88-4
4-Methyl-2-pentanone; Methyl isobutyl isobutyl ketone	108-10-1

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171
F 843.766.1178

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September 15, 2015

Ms. Nisreen Saikaly
Shealy Environmental Services, Inc.
106 Vantage Point Drive
Cayce, South Carolina 29172

Re: Routine Analysis - Saikaly (SESI2 EDD)
Work Order: 379552
SDG: QH13039

Dear Ms. Saikaly:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 18, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4707.

Sincerely,

Anna C Day

Anna Day
Project Manager

Chain of Custody: 50947 and 51325
Enclosures

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 – (843) 556-8171 – www.gel.com

Certificate of Analysis Report
for

SESI001 Shealy Environmental Services, Inc

Client SDG: QH13039 GEL Work Order: 379552

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a Tracer compound

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Anna Day.

Reviewed by Anna C Day

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	BG-1	Project:	SESI00309
Sample ID:	379552009	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 22:10		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	0.496	+/-1.35	2.39	3.00	pCi/L		AXM6	09/11/15	1147	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.802	+/-0.281	0.220	1.00	pCi/L		CXP3	09/15/15	0630	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			84	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-1	Project:	SESI00309
Sample ID:	379552001	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 11:15		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	0.538	+/-1.33	2.34	3.00	pCi/L		AXM6	09/11/15	1145	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.709	+/-0.330	0.393	1.00	pCi/L		CXP3	09/15/15	0545	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			86.1	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-2	Project:	SESI00309
Sample ID:	379552002	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 12:40		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	1.39	+/-1.36	2.26	3.00	pCi/L		AXM6	09/11/15	1145	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		1.33	+/-0.430	0.440	1.00	pCi/L		CXP3	09/15/15	0545	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			86.6	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-3	Project:	SESI00309
Sample ID:	379552003	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 14:10		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228		2.03	+/-1.21	1.85	3.00	pCi/L		AXM6	09/11/15	1146	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.990	+/-0.342	0.364	1.00	pCi/L		CXP3	09/15/15	0545	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			89.1	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-4	Project:	SESI00309
Sample ID:	379552004	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 15:10		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	1.52	+/-1.24	2.01	3.00	pCi/L		AXM6	09/11/15	1146	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.814	+/-0.319	0.365	1.00	pCi/L		CXP3	09/15/15	0545	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			92.8	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-5	Project:	SESI00309
Sample ID:	379552005	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 16:25		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	0.520	+/-1.37	2.41	3.00	pCi/L		AXM6	09/11/15	1146	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.564	+/-0.276	0.351	1.00	pCi/L		CXP3	09/15/15	0545	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			93.3	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-6	Project:	SESI00309
Sample ID:	379552006	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 18:30		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	1.26	+/-0.989	1.56	3.00	pCi/L		AXM6	09/11/15	1146	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.806	+/-0.322	0.372	1.00	pCi/L		CXP3	09/15/15	0630	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			85.3	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-7	Project:	SESI00309
Sample ID:	379552007	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 19:30		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	0.271	+/-1.09	1.96	3.00	pCi/L		AXM6	09/11/15	1146	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.423	+/-0.269	0.380	1.00	pCi/L		CXP3	09/15/15	0630	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			95	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	MW-8	Project:	SESI00309
Sample ID:	379552008	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 20:40		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	-0.831	+/-1.17	2.30	3.00	pCi/L		AXM6	09/11/15	1147	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.920	+/-0.360	0.389	1.00	pCi/L		CXP3	09/15/15	0630	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			90.7	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	SW-1	Project:	SESI00309
Sample ID:	379552010	Client ID:	SESI001
Matrix:	Water		
Collect Date:	13-AUG-15 07:45		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	0.426	+/-0.751	1.33	3.00	pCi/L		AXM6	09/11/15	1147	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.521	+/-0.277	0.366	1.00	pCi/L		CXP3	09/15/15	0630	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			90.8	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	SW-2	Project:	SESI00309
Sample ID:	379552011	Client ID:	SESI001
Matrix:	Water		
Collect Date:	13-AUG-15 08:30		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	0.468	+/-0.631	1.08	3.00	pCi/L		AXM6	09/11/15	1147	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.363	+/-0.240	0.345	1.00	pCi/L		CXP3	09/15/15	0705	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			95.1	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 15, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (SESI2 EDD)

Client Sample ID:	EQUIPMENT BLANK	Project:	SESI00309
Sample ID:	379552012	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 09:30		
Receive Date:	18-AUG-15		
Collector:	GEL		

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gas Flow Proportional Counting												
GFPC, Ra228, Liquid "As Received"												
Radium-228	U	1.13	+/-0.918	1.46	3.00	pCi/L		AXM6	09/11/15	1147	1504255	1
Rad Radium-226												
Lucas Cell, Ra226, liquid "As Received"												
Radium-226		0.489	+/-0.324	0.465	1.00	pCi/L		CXP3	09/15/15	0705	1501536	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 904.0/SW846 9320 Modified	
2	EPA 903.1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			91	(15%-125%)

Notes:
Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: September 15, 2015

Shealy Environmental Services, Inc.
106 Vantage Point Drive
Cayce, South Carolina

Contact: **Ms. Nisreen Saikaly**

Workorder: **379552**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Rad Gas Flow										
Batch 1504255										
QC1203384423 379552008 DUP										
Radium-228	U	-0.831	U	1.52	pCi/L	N/A		N/A	AXM6	09/11/15 11:47
	Uncertainty	+/-1.17		+/-1.28						
QC1203384424 LCS										
Radium-228	29.9			35.8	pCi/L		120	(75%-125%)		09/11/15 11:47
	Uncertainty			+/-2.97						
QC1203384422 MB										
Radium-228			U	1.05	pCi/L					09/11/15 11:47
	Uncertainty			+/-1.03						
Rad Ra-226										
Batch 1501536										
QC1203377192 379552003 DUP										
Radium-226		0.990		0.726	pCi/L	30.8		(0% - 100%)	CXP3	09/15/15 07:05
	Uncertainty	+/-0.342		+/-0.329						
QC1203377194 LCS										
Radium-226	24.7			26.4	pCi/L		107	(75%-125%)		09/15/15 07:40
	Uncertainty			+/-1.56						
QC1203377191 MB										
Radium-226			U	0.156	pCi/L					09/15/15 07:05
	Uncertainty			+/-0.210						
QC1203377193 379552003 MS										
Radium-226	124	0.990		112	pCi/L		90.2	(75%-125%)		09/15/15 07:05
	Uncertainty	+/-0.342		+/-7.10						

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

- ** Analyte is a Tracer compound
- < Result is less than value reported
- > Result is greater than value reported
- BD Results are either below the MDC or tracer recovery is low
- FA Failed analysis.
- H Analytical holding time was exceeded
- J Value is estimated
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- M M if above MDC and less than LLD
- M REMP Result > MDC/CL and < RDL
- N/A RPD or %Recovery limits do not apply.

QC Summary

Workorder: **379552**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
UI	Gamma Spectroscopy--Uncertain identification
UJ	Gamma Spectroscopy--Uncertain identification
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
h	Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

There are no "Data Exception Reports" associated with this analytical report.

SHEALY

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

379552

Number 50947

Client	Report to Contact: Nisreen Saikaly	Telephone No. / E-mail	Quote No.
Address	Sampler's Signature	Analysis (Attach list if more space is needed)	Page 1 of 2
City / State / Zip Code	X		
Project Name	Printed Name		QH13039 Laboratory Lot Number
Project No. / P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Radium 226 & 228	Remarks / Cooler I.D.
MW-1	8-12-15	1115	G	X				1					X	
MW-2		1240	G	X				1					X	
MW-3		1410	G	X				1					X	
MW-4		1510	G	X				1					X	
MW-5		1625	G	X				1					X	
MW-6		1830	G	X				1					X	
MW-7		1930	G	X				1					X	
MW-8		2040	G	X				1					X	
BG-1		2210	G	X				1					X	
SW-1	8-13-15	0745	G	X				1					X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ~~☐ Poison~~ ☒ Unknown

QC Requirements (Specify)

1. Relinquished by: Kelly	Date: 8-17-15	Time: 1800	1. Received by: Fedex	Date: 8-17-15	Time: 1800
2. Relinquished by	Date	Time	2. Received by: [signature]	Date: 8/18/15	Time: 8:35
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by	Date	Time	4. Laboratory received by	Date	Time

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 16 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

SHEALY

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

Number 51325

Client	Report to Contact: Nisreen Saikaly	Telephone No. / E-mail	Quote No.
Address	Sampler's Signature: X	Analysis (Attach list if more space is needed): Radium 226+228	Page 2 of 2
City / State / Zip Code	Printed Name		QH13039 Laboratory Lot Number
Project Name			
Project No. / P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Radium 226+228	Remarks / Cooler I.D.
SW-2	8-13-15	0830	G	X					1				X	
EQUIPMENT BLANK	8-12-15	0930	G	X					1				X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) X Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client X Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison X Unknown

QC Requirements (Specify)

1. Relinquished by: Kelly	Date: 8-17-15	Time: 1800	1. Received by: FedEx	Date: 8-17-15	Time: 1800
2. Relinquished by	Date	Time	2. Received by: [signature]	Date: 8/18/15	Time: 8:35
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by	Date	Time	4. Laboratory received by	Date	Time

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 16 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Sesi	SDG/AR/COC/Work Order: 379552
Received By: Sharita mack	Date Received: 8/18/15 8:35

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 16
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462966
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed? 8/18/15	+		✓	limited volume MW-2 Circle Applicable: Seals broken Damaged container Leaking container Other (describe) sample spilled out inside cooler
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples (EPA 6850) have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
8	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
9	Samples received within holding time?	✓			ID's and tests affected:
10	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
11	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
12	Number of containers received match number indicated on COC?			✓	Sample ID's affected: 1 cooler missing see below for containers not received.
13	Are sample containers identifiable as GEL provided?			✓	
14	COC form is properly signed in relinquished/received sections?	✓			
15	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 6465 8359 6774 6465 8359 6785

Comments (Use Continuation Form if needed):
The following samples were not received by lab on 8/18/15
MW-1
MW-8
SW-1
SW-2

PM (or PMA) review: Initials [illegible] Date 08/18/15 Page 1 of 1 GL-CHL-SR-001 Rev 1

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: SESI			**SDG/AR/COC/Work Order:** 379552
Received By: Shanta Mack			**Date Received:** 8/19/15 15:30
Suspected Hazard Information	**Yes**	**No**	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		✓		Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 23°C
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 130462962
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?			✓	Sample ID's, containers affected and observed pH: SW-2 sample received unpreserved. HNO3 added at Lab. If Preservation added, Lot#: lot # 104739
6	Do Low Level Perchlorate samples (EPA 6850) have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
8	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
9	Samples received within holding time?	✓			ID's and tests affected:
10	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
11	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
12	Number of containers received match number indicated on COC?			✓	Sample ID's affected: missing coolers received 8/19/15 see below for samples received today.
13	Are sample containers identifiable as GEL provided?			✓	
14	COC form is properly signed in relinquished/received sections?	✓			
15	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 6465 8359 6796

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HT Date 08/19/15 Page 1 of 1 GL-CHL-SR-001 Rev 1

List of current GEL Certifications as of 15 September 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

GEL Laboratories LLC
a member of The GEL Group INC

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gel.com

September 08, 2015

Ms. Nisreen Saikaly
Shealy Environmental Services, Inc.
106 Vantage Point Drive
Cayce, South Carolina 29172

Re: Routine Analysis - Saikaly (No EDD)
Work Order: 380008

Dear Ms. Saikaly:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 25, 2015. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4707.

Sincerely,

Anna C Day

Anna Day
Project Manager

Chain of Custody: 51339 and 51340
Enclosures

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

Certificate of Analysis Report
for

SESI001 Shealy Environmental Services, Inc

Client SDG: 380008 GEL Work Order: 380008

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a Tracer compound

** Analyte is a surrogate compound

J Value is estimated

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Anna Day.

Reviewed by Anna C Day

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	BG-1	Project:	SESI00315
Sample ID:	380008009	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 22:10		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		18.5	2.00	10.0	ug/L	1	SKJ	08/31/15	1532	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-1	Project:	SESI00315
Sample ID:	380008001	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 11:15		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		32.0	2.00	10.0	ug/L	1	SKJ	08/31/15	1512	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-2	Project:	SESI00315
Sample ID:	380008002	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 12:40		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		22.4	2.00	10.0	ug/L	1	SKJ	08/31/15	1537	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-3	Project:	SESI00315
Sample ID:	380008003	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 14:10		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		19.3	2.00	10.0	ug/L	1	SKJ	08/31/15	1539	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-4	Project:	SESI00315
Sample ID:	380008004	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 15:20		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		22.6	2.00	10.0	ug/L	1	SKJ	08/31/15	1540	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

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Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-5	Project:	SESI00315
Sample ID:	380008005	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 16:25		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium	J	7.18	2.00	10.0	ug/L	1	SKJ	08/31/15	1541	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

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Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-6	Project:	SESI00315
Sample ID:	380008006	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 18:30		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		28.1	2.00	10.0	ug/L	1	SKJ	08/31/15	1528	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

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Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-7	Project:	SESI00315
Sample ID:	380008007	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 19:30		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		21.1	2.00	10.0	ug/L	1	SKJ	08/31/15	1530	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

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Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	MW-8	Project:	SESI00315
Sample ID:	380008008	Client ID:	SESI001
Matrix:	Water		
Collect Date:	12-AUG-15 20:40		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium		27.6	2.00	10.0	ug/L	1	SKJ	08/31/15	1531	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

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Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	SW-1	Project:	SESI00315
Sample ID:	380008010	Client ID:	SESI001
Matrix:	Water		
Collect Date:	13-AUG-15 07:45		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium	U	ND	2.00	10.0	ug/L	1	SKJ	08/31/15	1533	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	SW-2	Project:	SESI00315
Sample ID:	380008011	Client ID:	SESI001
Matrix:	Water		
Collect Date:	13-AUG-15 08:30		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium	U	ND	2.00	10.0	ug/L	1	SKJ	08/31/15	1520	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 8, 2015

Company :	Shealy Environmental Services, Inc.
Address :	106 Vantage Point Drive
	Cayce, South Carolina 29172
Contact:	Ms. Nisreen Saikaly
Project:	Routine Analysis - Saikaly (No EDD)

Client Sample ID:	EQUIPMENT BLANK	Project:	SESI00315
Sample ID:	380008012	Client ID:	SESI001
Matrix:	Water		
Collect Date:	13-AUG-15 09:30		
Receive Date:	25-AUG-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP-MS											
200.2/200.8 Lithium "As Received"											
Lithium	U	ND	2.00	10.0	ug/L	1	SKJ	08/31/15	1525	1503250	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 200.2	ICP-MS 200.2 PREP	JP1	08/26/15	1615	1503249

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 200.8	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: September 8, 2015

Shealy Environmental Services, Inc.
106 Vantage Point Drive
Cayce, South Carolina

Contact: **Ms. Nisreen Saikaly**

Workorder: **380008**

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS											
Batch 1503250											
QC1203381883 380008001 DUP											
Lithium			32.0		31.7	ug/L	0.813 ^		(+/-10.0)	SKJ	08/31/15 15:13
QC1203381884 380008011 DUP											
Lithium		U	ND	U	ND	ug/L	N/A				08/31/15 15:21
QC1203381882 LCS											
Lithium	50.0				49.2	ug/L		98.5	(85%-115%)		08/31/15 15:11
QC1203381881 MB											
Lithium				U	ND	ug/L					08/31/15 15:09
QC1203381885 380008001 MS											
Lithium	50.0		32.0		78.7	ug/L		93.4	(75%-125%)		08/31/15 15:14
QC1203381886 380008011 MS											
Lithium	50.0	U	ND		50.2	ug/L		99.1	(75%-125%)		08/31/15 15:22
QC1203381887 380008001 SDILT											
Lithium			32.0	J	6.91	ug/L	8.09		(0%-10%)		08/31/15 15:16
QC1203381888 380008011 SDILT											
Lithium		U	ND	U	ND	ug/L	N/A		(0%-10%)		08/31/15 15:23

Notes:

The Qualifiers in this report are defined as follows:

- < Result is less than value reported
- > Result is greater than value reported
- E %difference of sample and SD is >10%. Sample concentration must meet flagging criteria
- FB Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies
- H Analytical holding time was exceeded
- J Value is estimated
- N Metals--The Matrix spike sample recovery is not within specified control limits
- N/A RPD or %Recovery limits do not apply.
- N1 See case narrative
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

QC Summary

Workorder: **380008**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
h	Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

There are no "Data Exception Reports" associated with this analytical report.

TO: GEL

SHEALY

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

AD 8/26/15 ~~379~~ **Number** 51339 380008

Client	Report to Contact: Nisreen Saikaly	Telephone No. / E-mail	Quote No.
Address	Sampler's Signature	Analysis (Attach list if more space is needed)	Page 1 of 2
City / State / Zip Code	X		
Project Name	Printed Name		Q H13039 Laboratory Lot Number
Project No. / P.O. No.			

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit			Remarks / Cooler I.D.
MW-1	8-12-15	1115	G	X					1					X	
MW-2		1240		X					1					X	
MW-3		1410		X					1					X	
MW-4		1520		X					1					X	
MW-5		1625		X					1					X	
MW-6		1830		X					1					X	
MW-7		1930		X					1					X	
MW-8		2040		X					1					X	
BG-1		2210		X					1					X	
SW-1	8-13-15	0745		X					1					X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Kelley [signature]	8-24-15	1800	1. Received by: Fedex	8-24-15	1800
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by: [signature] Mack	8/25/15	8:50

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 0 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

SHEALY

Chain of Custody Record

SHEALY ENVIRONMENTAL SERVICES, INC.
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.shealylab.com

TO: GEL

Number 51340

Client	Report to Contact: Nisreen Saikaly	Telephone No. / E-mail	Quote No.
Address	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page 2 of 2
City / State / Zip Code	Printed Name		QH13039 Laboratory Lot Number
Project Name			
Project No.	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Date	Time	G=Grab C=Composite	Matrix: Aqueous	Solid	New Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit			Remarks / Cooler I.D.
SW-2	8-13-15	~~0745~~ 0830	G	X					1					X	
EQUIPMENT BLANK	8-13-15	~~0830~~ 0930	G	X					1					X	

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☑ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown

QC Requirements (Specify)

1. Relinquished by: Kelly	Date: 8-24-15	Time: 1800	1. Received by: Fedex	Date: 8-24-15	Time: 1800
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by	Date	Time	4. Laboratory received by: mack	Date: 8/25/15	Time: 8:50

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. 6 °C

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: F-AD-133 Effective Date: 08-01-2014

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: Sesi	SDG/AR/COC/Work Order: 380008
Received By: Shanta Mack	Date Received: 8/25/15 8:50

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: Ice bags Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): 6503201583 5
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	Do Low Level Perchlorate samples (EPA 6850) have headspace as required?		✓		Sample ID's and containers affected:
7	VOA vials free of headspace (defined as < 6mm bubble)?		✓		Sample ID's and containers affected:
8	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
9	Samples received within holding time?	✓			ID's and tests affected:
10	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
11	Date & time on COC match date & time on bottles?			✓	Sample ID's affected: Equipment Blank date on sample is 8/12/15
12	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
13	Are sample containers identifiable as GEL provided?			✓	
14	COC form is properly signed in relinquished/received sections?	✓			
15	Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 6465 8359 7233

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials AVD Date 8/26/15 Page 1 of 1

GL-CHL-SR-001 Rev 1

List of current GEL Certifications as of 08 September 2015

State	Certification
Alaska	UST-110
Arkansas	88-0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC000122013-10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-12-00283, P330-12-00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013-10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC000122013-10
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68-00485
Plant Material Permit	PDEP-12-00260
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-15-10
Utah NELAP	SC000122015-18
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

APPENDIX D
USGS PUBLICATION – CHLORIDE IN GROUNDWATER

USGS
science for a changing world

Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan

INTRODUCTION

In 1996, the U.S. Geological Survey (USGS), in cooperation with the Michigan Department of Environmental Quality (MDEQ) and nine southeast Michigan counties, began a study of the factors controlling arsenic concentrations in drinking water. The early results of this study raised broader concerns in Oakland County about the quality of groundwater in general and drinking water in particular. In response to these concerns, Oakland County worked with the USGS and the Center for Applied Environmental Research at the University of Michigan – Flint (CAER) to study distributions of arsenic, nitrate, and chloride in groundwater, with emphasis on sites where concentrations of these constituents exceeded the Maximum Contaminant Levels (MCL's) and Secondary Maximum Contaminant Levels (SMCL's) set by the U.S. Environmental Protection Agency (USEPA). The maps produced for this report are based on historical data compiled from MDEQ records. This fact sheet is a revision of USGS Fact Sheet 135-98, "Arsenic, nitrate, and chloride in groundwater in Oakland County in Oakland County, Michigan" (Aichele and others, 1998) to incorporate revisions to the USEPA MCL for arsenic.

ARSENIC

Arsenic is a naturally occurring element in the environment. Historically, arsenic compounds have been used in the manufacture of pesticides, metal products, pigments and dyes, and medicine. Concentrations of arsenic in water have been expressed in a variety of ways: milligrams per liter (mg/L), micrograms per liter (µg/L) or parts per billion (ppb). These units can be compared as follows: 1 mg/L = 1,000 µg/L = 1,000 ppb. The U.S. Environmental Protection Agency (2001) MCL for arsenic in drinking water is 0.01 mg/L, 10 µg/L or 10 ppb. This new standard was announced in January 2001 with full compliance required for all public water systems by January 2006. One part per billion, expressed as time, is 1 second in approximately 31 and one half years.

What is the source of arsenic in groundwater?

Arsenic is the twentieth most common element in the Earth's crust, and is present in the soil and rocks of Oakland County. Arsenic in groundwater is usually a result of arsenic minerals dissolving naturally over time.

Where does arsenic occur in Oakland County?

Low concentrations of arsenic can be found in wells all across Oakland County. Out of 1,988 wells sampled, 663 (about 33 percent) exceeded the new MCL of 10 µg/L. These wells are distributed throughout the county, except in Royal Oak survey township (fig.2). Relatively little sampling has been done anywhere in the southeast part of the county. The highest arsenic concentration detected in Oakland County is 221 µg/L (221 ppb).

Figure 1. *A new well being drilled in Oakland County. Over 3,000 new drinking-water wells are drilled each year in Oakland County.*

Arsenic is present in all of the major aquifers of Oakland County, including the glacial drift, the Marshall Sandstone, and the Coldwater Shale, although it does not appear to occur in very shallow (<40 ft) wells completed in glacial drift. Testing conducted as part of this study found arsenic concentrations in groundwater comparable to historical Oakland County Health Division (OCHD) and MDEQ measurements.

Is arsenic in drinking water a concern?

The health effects of arsenic depend on the amount consumed (measured in µg). This amount is determined by the concentration of arsenic in the water (measured in µg/L) and the quantity of water consumed (measured in L). A person who

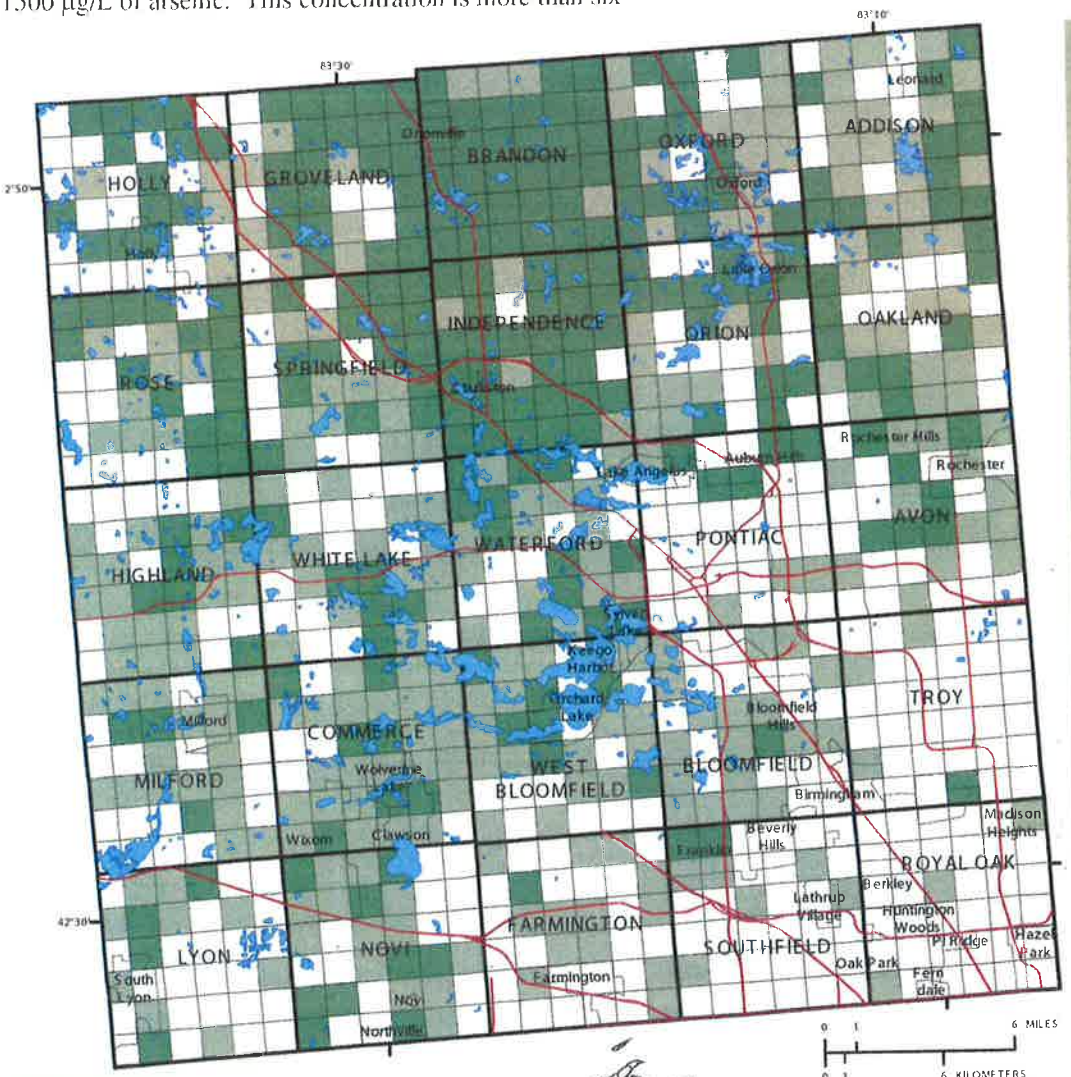
drinks 1L (approximately four 8-ounce glasses) of water per day containing arsenic at a concentration of 10 µg/L, which is the MCL, would consume about 10 µg of arsenic per day from drinking water. Certain foods, such as shellfish, can also contain significant levels of arsenic. Individuals consuming up to 500 µg of arsenic per day from all sources are unlikely to experience any symptoms of illness, but may increase their long-term risk of cancer (Kosnett, 1997). Persons consuming more than 500 µg of arsenic per day from all sources for several years may exhibit certain chronic health problems, including a characteristic pattern of skin abnormalities, a tingling sensation in the extremities, or anemia (Kosnett, 1997).

Persons regularly consuming more than 1,500 µg of arsenic per day may experience fatigue, gastrointestinal disturbances, and certain types of heart problems (Kosnett, 1997). To have this highest level of exposure from drinking water alone, a person would have to regularly consume 1L of water containing 1500 µg/L of arsenic. This concentration is more than six times higher than the highest concentration observed in Oakland County, and 150 times greater than the new MCL.

Arsenic is classified as a carcinogen by the USEPA. USEPA MCLs are set at 10 percent of the exposure dose that produces a response in 1 percent of the population (National Research Council,2000). For example, the National Research Council (2001) estimates that consumption of 1L per day of water with an arsenic concentration of 10 µg/L over a lifetime will produce bladder cancer in 12 out of 10,000 women and 23 out of 10,000 men.

NITRATE

Nitrate is formed when oxygen in air or dissolved in water combines with nitrogen. The U.S. Environmental Protection Agency (1996a) has set a MCL of 10 mg-N/L (milligrams of nitrogen per liter) for nitrate in drinking water. Nitrate can occur naturally in precipitation, at concentrations typically



EXPLANATION

- Section where sample of arsenic was unavailable
- Section where sample of arsenic had a concentration less than 0.01 mg/L
- Section where sample of arsenic had a concentration greater than or equal to 0.01 mg/L

SOURCES: Michigan Department of Environmental Quality 1983-1997 (excluding 1991-92)
Michigan Department of Natural Resources, Michigan Resource Information System (MIRIS), 1978

Figure 2. Oakland County arsenic distribution.

Important Points About Arsenic

- *Arsenic occurs naturally in groundwater as arsenic minerals dissolve over time.*
- *Arsenic concentrations in 663 out of 1,988 wells sampled in Oakland County exceeded the new MCL of 0.01 mg/L (10 µg/L or 10 ppb).*
- *Low concentrations of arsenic are present in all the major aquifers of Oakland County.*
- *Immediate reactions to arsenic in drinking water are unlikely at the concentrations found in Oakland County.*
- *The health effects of arsenic depend on the concentration of arsenic in drinking waterand the amount of water consumed.*
- *OCHD recommends that all private well owners test regularly for arsenic.*

around 1 mg-N/L. Elevated concentrations, particularly those greater than 3 mg-N/L, are usually the result of human activity (U.S. Environmental Protection Agency, 1996b).

What is the source of nitrate in groundwater?

In Oakland County, the likely sources of elevated nitrate in drinking water are septic tank leachate and fertilizers, both of which are rich in nitrogen. Nitrate dissolves readily in water and moves freely with water through soil and rock where it is commonly consumed by microorganisms. Nitrate at concentrations greater than 3 mg-N/L indicates a fairly direct connection between one of the sources listed above and the drinking-water supply.

Where does nitrate occur in Oakland County?

Nitrate concentrations in excess of the 10 mg-N/L MCL have been found in groundwater in most townships in Oakland County (fig.3). The exceedances often occur in high-density lakeshore communities using on-lot wells and septic systems. As an example, wells within 1 mile of Union Lake, Wolverine Lake, or Commerce Lake account for more than one third of all nitrate concentrations greater than 10 mg-N/L.

Is nitrate in drinking water a concern?

A nitrate standard is required by the USEPA because nitrite, which is produced when nitrate is broken down in the body, can impair the ability of the blood to carry oxygen. Elevated nitrate is not typically a concern for healthy people, but fetuses, infants (under 6 months), and the elderly are populations at risk. "Blue-baby syndrome" (infantile methemoglobinemia) resulting from high nitrate consumption can be lethal in infants (U.S. Environmental Protection Agency, 1996b).

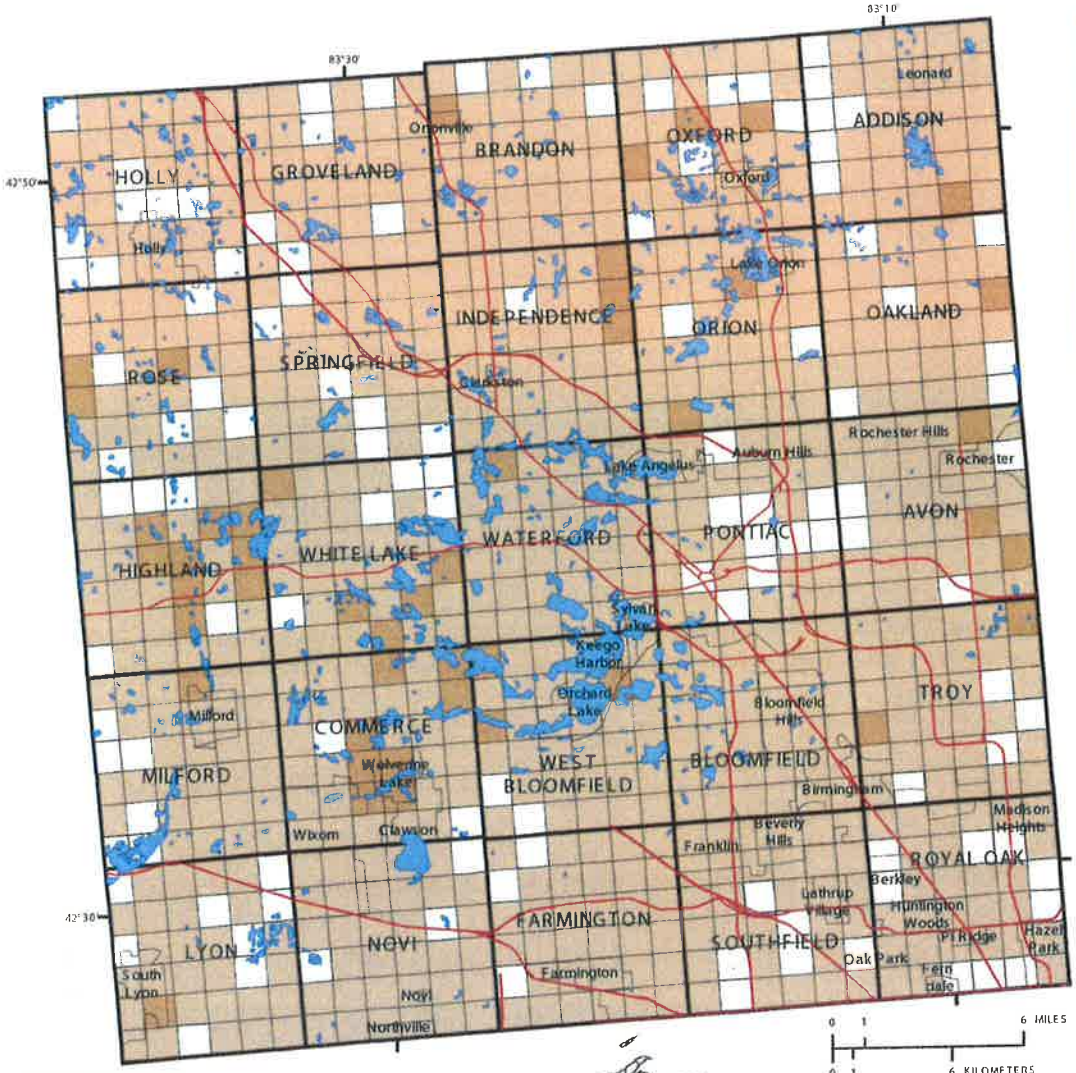


Figure 3. Oakland County nitrate distribution.

Important Points about Nitrate

- *Nitrate concentrations that exceed the 10 mg-N/L MCL have been found in most Oakland County townships.*
- *In Oakland County, the likely sources of elevated nitrate concentrations in groundwater are septic tank leachate and fertilizers.*
- *Nitrate concentrations in 84 out of 6,197 wells sampled in Oakland County exceeded the MCL of 10 mg-N/L.*
- *Nitrate concentrations of 10 mg-N/L or greater are often found in high-density lakeshore communities.*
- *Elevated concentrations are not typically a problem for healthy people, but they pose a risk to fetuses, infants and the elderly.*
- *OCHD recommends that all private well owners test regularly for nitrate.*

CHLORIDE

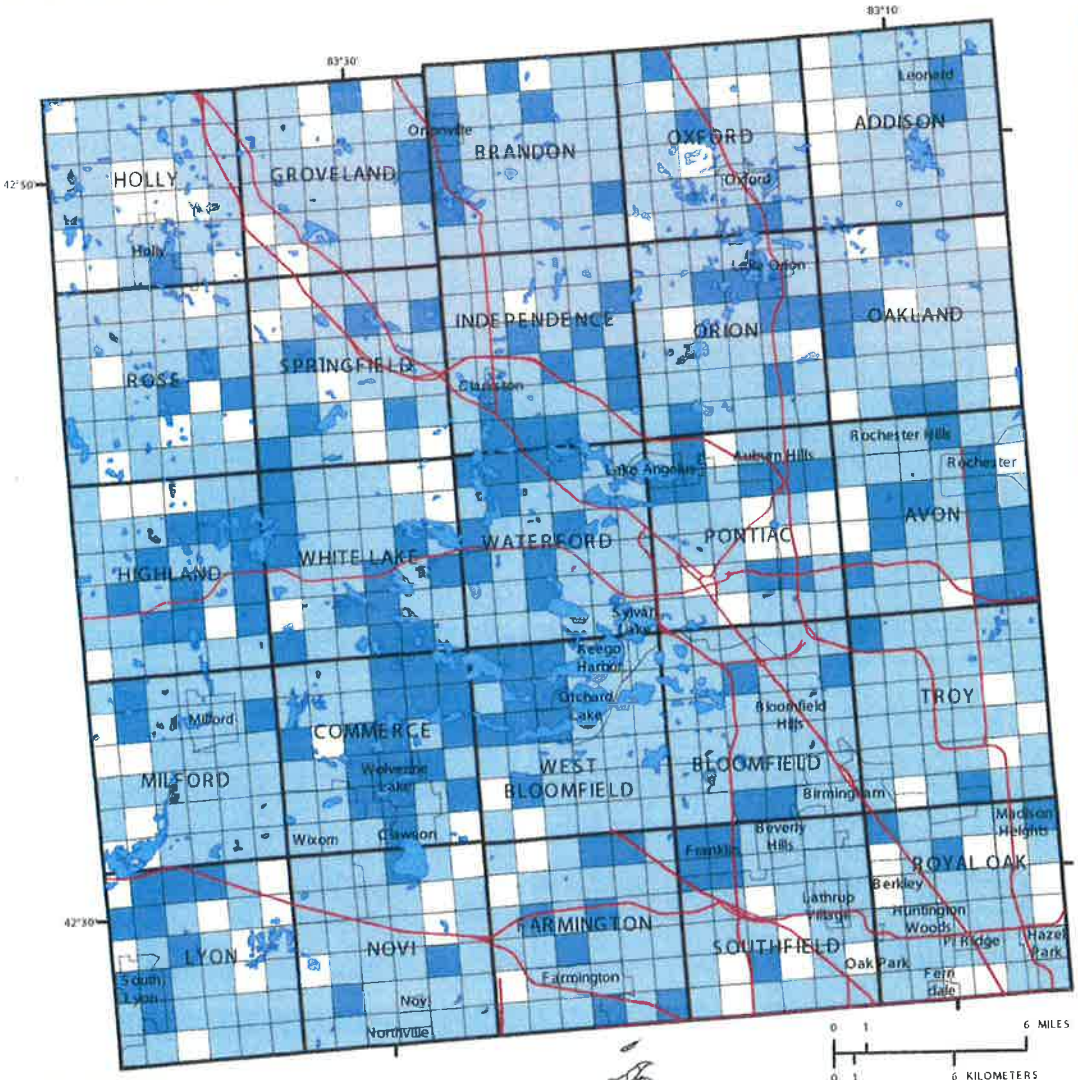
Chloride is an element found in most common salts, such as road salt, table salt, and water-softener salt. The USEPA (1996a) has set a SMCL of 250 mg/L for chloride. This limit was established because water with chloride concentrations greater than 250 mg/L tastes salty to most people. Chloride is naturally present in groundwater, particularly in deep bedrock aquifers. Background concentrations of chloride in drinking-water wells are highly variable, ranging from less than 10 mg/L in some glacial aquifers to more than 500 mg/L in deeper bedrock wells.

What is the source of chloride in drinking water?

Chloride occurs naturally in some sedimentary bedrock layers, particularly shales. This chloride is a remnant of the seawater present at the time the rocks were formed. Chloride is very soluble in water and moves freely with water through soil and rock. Chloride is not readily consumed by microorganisms, so it is more persistent than nitrate. Road salt, applied for deicing or dust control, may infiltrate the soil and contaminate groundwater. Chloride also may originate from septic tank leachate, as a result of water softening or other activities in the household.

Where does chloride occur in Oakland County?

Chloride concentrations in excess of 250 mg/L are widely distributed in Oakland County (fig.4). They are commonly associated with high-density lakeshore communities using on-lot wells and septic systems. The chloride found in shallow wells around lakes and in densely populated areas probably comes from salts used in the household and then discharged through septic systems. Elevated chloride levels also may be



EXPLANATION

- Section where sample of chloride was unavailable
- Section where sample of chloride had a concentration less than 250.0 mg/L
- Section where sample of chloride had a concentration greater than or equal to 250.0 mg/L

SOURCES: Michigan Department of Environmental Quality 1983-1997 (excluding 1991-92)
Michigan Department of Natural Resources, Michigan Resource Information System (MIRIS), 1978

Figure 4. Oakland County chloride distribution.

Important Points about Chloride

- *Chloride occurs naturally in groundwater and is also in most common salts.*
- *Chloride concentrations in 366 out of 6,227 wells sampled in Oakland County exceeded the SMCL of 250 mg/L.*
- *High concentrations are often associated with high density, lakeshore communities.*
- *Elevated chloride concentrations may be associated with road salt applications or storage and septic tank leachate.*
- *Chloride is not generally considered to be a health concern.*
- *The SMCL of 250 mg/L is based on aesthetic considerations (taste) rather than health considerations.*

associated with road salt application or storage. Several caseshave been documented in Oakland County of road salt storage facilities leaching chloride into groundwater.

Is chloride in drinking water a concern?

Chloride is not generally considered to be a health concern. However, some evidence indicates that high chloride intake may pose a hazard to persons with heart or kidney disease (Hutchinson, 1970).

HOW WERE THE MAPS PREPARED?

The MDEQ maintains a database of results from water-quality tests conducted for homeowners and businesses. In this study, maps were prepared from records of tests in Oakland County where arsenic, nitrate and chloride measurements were made. The data spanned the years from 1988 through 1997 (excluding 1991-92).

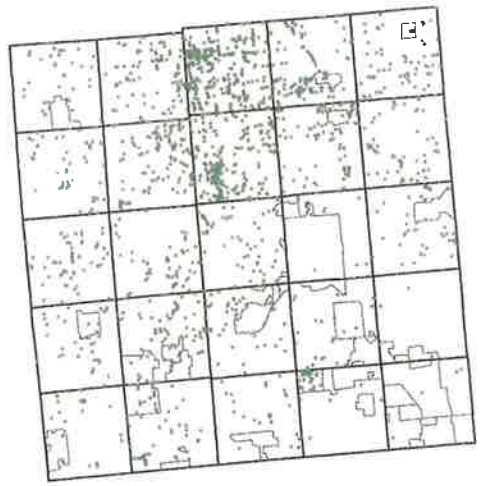
Addresses for each of the records were matched to an Oakland County road file through an address-matching procedure in a Geographic Information System. The address-matching percentage for each constituent indicates how many records were finally mapped (fig. 5). All sites with arsenic concentrations greater than the MCL were mapped. For nitrate and chloride, the success rates were 94 percent and 81 percent, respectively. Data coverage for all the chemical constituents was extensive, although the distribution of test results for arsenic was least concentrated in the southeastern part of the county, where pulic-water supply is most available. The number of nitrate and chloride test results is much greater, and their locations more evenly distributed throughout the county (fig. 5).

To prepare the final maps, locations of wells with a measurement for each of the chemical constituents were plotted on an Oakland County base map. When wells had more than one measurement, the highest measured concentration was used. Sections containing a well with a measured concentration higher than the (S)MCL were identified with dark shading. Sections containing a well with a measured concentration less than the (S)MCL were identified with a lighter shading. Sections were left unshaded if no sample information was available.

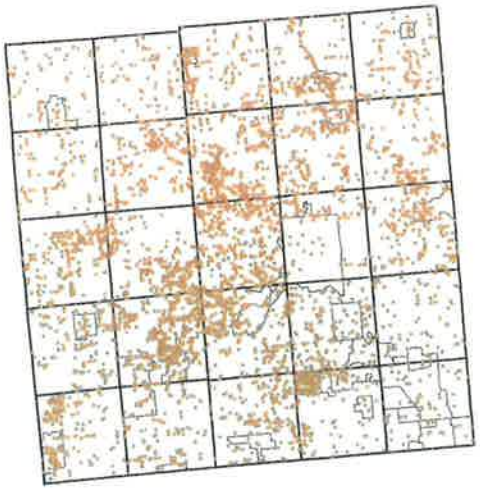
HOW WERE THE SAMPLE DATA COLLECTED AND EVALUATED?

The USGS collected water samples across Oakland County at selected sites with previous analyses for arsenic, nitrate, or chloride. Each new sample was collected using clean sampling techniques to minimize the risk of contamination. Duplicate samples were sent to both the MDEQ lab and the USGS National Water Quality Lab (NWQL) in Denver, Colorado. Results from the USGS NWQL were compared against the results from MDEQ and against results from the previous samples. The results from the MDEQ lab agreed very closely with the results from the USGS NWQL. This sample testing confirmed the validity of using the MDEQ database in maps prepared for the study.

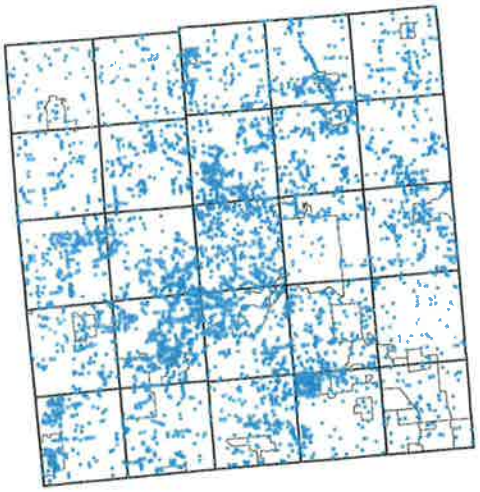
Figure 5. Locations of well records used to prepare the county maps.



Total arsenic samples: 3,509 Total unique samples: 2,373
Unique locations mapped: 1,988 (84%)



Total nitrate samples: 12,942 Total unique samples: 7,814
Unique locations mapped: 6,197 (79%)



Total arsenic samples: 12,960 Total unique samples: 7,809
Unique locations mapped: 6,227 (80%)

What does all this mean?

·The maps refer to all areas not serviced by public water. Public water supply wells are routinely monitored to ensure compliance with U.S. Environmental Protection Agency standards.

·Arsenic, nitrate, and chloride were the only constituents addressed in this study. Other potential water contaminants have been observed in Oakland county and may occur in your area. Please contact the OCHD for details specific to your area.

·All the maps support the OCHD recommendation that homeowners regularly test drinking water that comes from wells.

·Each of the chemical constituents evaluated is widely distributed and homeowners should carefully review the county maps to see if their homes are in areas where concentrations above the U.S. Environmental Protection Agency standard have been reported. Township maps, which are included on separate fact sheets, provide more specific details on particular locations.

·Some individuals may be more sensitive than others to contaminants in drinking water. If symptoms persist, OCHD recommends you consult a physician for assistance.

SUMMARY

The distributions of arsenic, nitrate and chloride concentrations in groundwater in Oakland County, Michigan were investigated on the basis of historical water-quality data obtained from MDEQ databases. Results indicate that of the wells sampled in Oakland County, about 33 percent exceeded the USEPA MCL for arsenic, about 1 percent exceeded the USEPA MCL for nitrate, and about 6 percent exceeded the USEPA SMCL for chloride. Maps provided in this report show the known distribution of arsenic, nitrate, and chloride in groundwater within Oakland County, Michigan.

—By Steve Aichele (USGS)

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For more information, contact:

OAKLAND COUNTY MICHIGAN

Oakland County Health Division
1200 N. Telegraph Road
Pontiac, MI 48341-0432
(248) 858-1312
http://www.co.oakland.mi.us

USGS
science for a changing world

U.S. Geological Survey,
Water Resources Division
6520 Mercantile Way, Ste.5
Lansing, MI 48911
(517) 887-8903
http://www.usgs.gov

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APPENDIX E
EPA PUBLICATION – DISINFECTION BYPRODUCTS IN DRINKING WATER

EPA United States Environmental Protection Agency

Water: Basic Information about Regulated Drinking Water Contaminants

Basic Information about Disinfection Byproducts in Drinking Water: Total Trihalomethanes, Haloacetic Acids, Bromate, and Chlorite

To protect drinking water from disease-causing organisms, or pathogens, water suppliers often add a disinfectant, such as chlorine, to drinking water. However, disinfection practices can be complicated because certain microbial pathogens, such as *Cryptosporidium*, are highly resistant to traditional disinfection practices. Also, disinfectants themselves can react with naturally-occurring materials in the water to form byproducts, which may pose health risks.

A major challenge for water suppliers is how to control and limit the risks from pathogens and disinfection byproducts. It is important to provide protection from pathogens while simultaneously minimizing health risks to the population from disinfection byproducts. For more information, see fact sheets on Pathogens and Indicators and Disinfectants.

- What disinfection byproducts does EPA regulate, how are they formed, and what are their health effects in drinking water at levels above the maximum contaminant level?
- What are EPA's drinking water regulations for disinfection byproducts?
- How will I know if disinfection byproducts are in my drinking water?
- How will disinfection byproducts be removed from my drinking water?
- How do I learn more about my drinking water?

What disinfection byproducts does EPA regulate, how are they formed, and what are their health effects in drinking water at levels above the maximum contaminant level?

Disinfection Byproduct (Chemical Abstract Service Registry Number)	How is it formed?	Health Effects
Total Trihalomethanes		
Bromodichloromethane (75-27-4)	Trihalomethanes occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing total trihalomethanes in excess of the MCL over many years could experience liver, kidney, or central nervous system problems and increased risk of cancer.
Bromoform (75-25-2)		
Dibromochloromethane (124-48-1)		
Chloroform (67-66-3)		
Haloacetic acids:		
Dichloroacetic acid (79-43-6)	Haloacetic acids occur when naturally-occurring organic and inorganic materials in the water react with the disinfectants, chlorine and chloramine.	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Trichloroacetic acid (76-03-9)		
Chloroacetic acid (79-11-8)		
Bromoacetic acid(79-08-3)		
Dibromoacetic acid (631-64-1)		
Bromate (15541-45-4)	Bromate occurs when bromide in the water reacts with the disinfectant, ozone.	Some people who drink water containing bromate in excess of the MCL over many years may have an increased risk of getting cancer.
Chlorite (7758-19-2)	Chlorite occurs when chlorine dioxide breaks down.	Some infants and young children who drink water containing chlorite in excess of the MCL could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorite in excess of the MCL. Some people may experience anemia.

This health effects language is not intended to catalog all possible health effects for disinfection byproducts. Rather, it is intended to inform consumers of some of the possible health effects associated with disinfection byproducts in drinking water when the rule was finalized.

What are EPA's drinking water regulations for disinfection byproducts?

In 1974, Congress passed the Safe Drinking Water Act. This law requires EPA to determine the level of contaminants in drinking water at which no adverse health effects are likely to occur. These non-enforceable health goals, based solely on possible health risks and exposure over a lifetime, with an adequate margin of safety, are called maximum contaminant level goals (MCLG). Contaminants are any physical, chemical, biological or radiological substances or matter in water. EPA sets MCLGs based on the best available science to prevent potential health problems.

Based on the MCLG, EPA sets an enforceable regulation called a maximum contaminant level (MCL). MCLs are set as close to the health goals as possible, considering cost, benefits and the ability of public water systems to detect and remove contaminants using suitable treatment technologies. MCLs for disinfection byproducts are set at the following levels:

Levels for Total Trihalomethanes		
Disinfection Byproduct	**MCLG**	**MCL**
Bromodichloromethane	Zero	0.080 MG/L or 80 PPB (Sum of the concentrations of all four trihalomethanes) as an annual average
Bromoform	Zero	
Dibromochloromethane	0.06 MG/L or 60 PPB	
Chloroform	0.07 MG/L or 70 PPB	

Levels for Haloacetic acids		
Disinfection Byproduct	**MCLG**	**MCL**
Dichloroacetic acid	Zero	0.060 MG/L or 60 ppb (Sum of the concentrations of all five haloacetic acids) as an annual average
Trichloroacetic acid	0.02 MG/L or 20 PPB	
Monochloroacetic acid	0.07 MG/L or 70 PPB	
Bromoacetic acid	Regulated with this group but has no MCLG	
Dibromoacetic acid	Regulated with this group but has no MCLG	
Bromate	Zero	0.010 MG/L or 10 PPB as an annual average
Chlorite	0.80 MG/L or 800 ppb	1.0 MG/L or 1 part per million (ppm)

MCLs are set as close to the health goals as possible, considering cost, benefits and the ability of public water systems to detect and remove contaminants using suitable treatment technologies. States may set more stringent drinking water MCLGs and MCLs for disinfection byproducts than EPA.

The following drinking water regulations apply to disinfectants and disinfection byproducts:

- Stage 1 Disinfectants and Disinfection Byproducts Rule (Stage 1 DBP) (December 16, 1998)
  The Stage 1 Disinfectants and Disinfection Byproducts Rule reduces exposure to disinfection byproducts for customers of community water systems and non-transient non-community systems, including those serving fewer than 10,000 people, that add a disinfectant to the drinking water during any part of the treatment process.
- Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 DBP) (December 15, 2005)
  Stage 2 DBP rule builds upon earlier rules that addressed disinfection byproducts to improve your drinking water quality and provide additional public health protection from disinfection byproducts.

The Safe Drinking Water Act requires EPA to periodically review the national primary drinking water regulation for each contaminant and revise the regulation, if appropriate, based on new scientific data. EPA will include the Disinfectants and Disinfection Byproducts rules in a future review cycle.

- More information on the Six Year Review of Drinking Water Standards

How will I know if disinfection byproducts are in my drinking water?
When routine monitoring indicates that disinfection byproduct levels are above the MCL, your water supplier must take steps to reduce the amount of disinfection byproductsso that they are below that level. Water suppliers must notify their customers as soon as practical, but no later than 30 days after the system learns of the violation. Additional actions, such as providing alternative drinking water supplies, may be required to prevent serious risks to public health.

- See EPA's public notification requirements for public water systems.

How will disinfection byproducts be removed from my drinking water?
Water systems that use surface water or ground water under the direct influence of surface water and use conventional filtration treatment are required to remove specified percentages of organic materials that may react with disinfectants to form disinfection byproducts, prior to disinfection. Other control strategies include modification of disinfection practices in a manner that still provides adequate protection against pathogens.

How do I learn more about my drinking water?
EPA strongly encourages people to learn more about their drinking water, and to support local efforts to protect the supply of safe drinking water and upgrade the community water system. Your water bill or telephone book's government listings are a good starting point for local information.

Contact your water utility. EPA requires all community water systems to prepare and deliver an annual consumer confidence report (CCR) (sometimes called a water quality report) for their customers by July 1 of each year. If your water provider is not a community water system, or if you have a private water supply, request a copy from a nearby community water system.

- The CCR summarizes information regarding sources used (i.e., rivers, lakes, reservoirs, or aquifers), detected contaminants, compliance and educational information.
- Some water suppliers have posted their annual reports on EPA's website.

Other EPA websites

You will need Adobe Reader to view some of the files in this section. See EPA's PDF page to learn more.

C

Appendix C – Boring Logs and Well Construction Records

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-1

Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

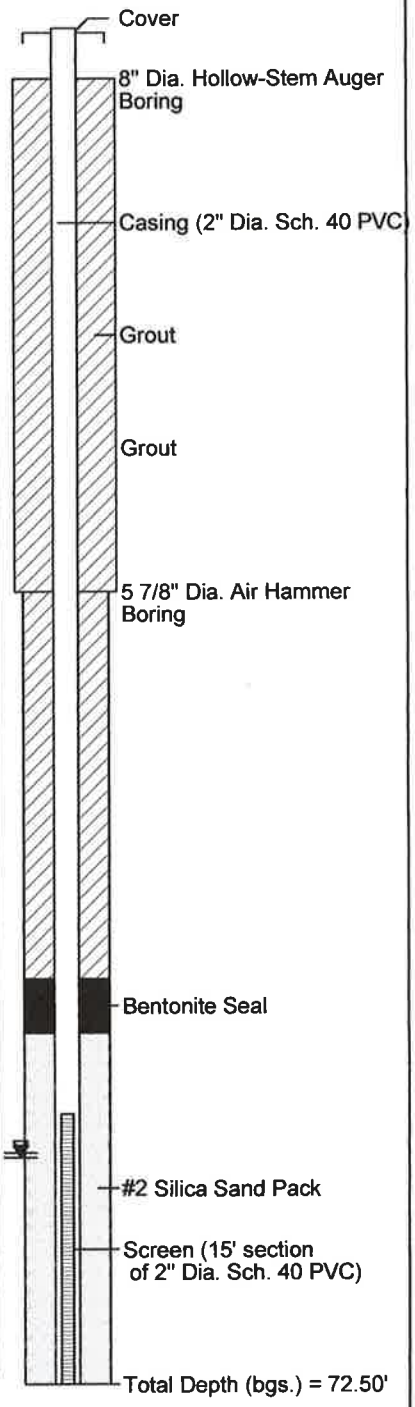
Date Started:	: 6/19/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/22/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 280.08' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 277.28' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	slight cut

Water Levels
- 1 Hour = 59.90' bgs
- 24 Hours = 59.65' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	277.28				
5	272.28	3 5 6	SS	16	moist; stiff; reddish yellow (7.5YR 6/8) with light gray and rust mottles; silty clay with quartz gravel; cohesive; high plasticity; Soil Horizon
10	267.28	6 10 19	SS	16	moist; very stiff; dark reddish brown (2.5YR 3/4) with light tan and gray specks; horizontal fissile; silty clay; cohesive; medium plasticity
15	262.28	5 10 15	SS	14	moist; very stiff; reddish brown (2.5YR 4/4); horizontal blocky fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
20	257.28	9 15 24	SS	15	moist; very stiff; reddish brown (2.5YR 4/4) with rust, light tan and black horizontal bands and mottles; horizontal blocky fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
25	252.28	50/4"	SS	4	dry; very hard; weak red (10R 5/2) with red mottles; horizontal fissile; weathered mudstone; Partially Weathered Rock
		50/2"	SS	3	
30	247.28				dry; very hard; weak red (10R 5/2) with red mottles; horizontal fissile; weathered mudstone; Partially Weathered Rock; Auger Refusal @ 28.5'
35	242.28		cuttings		moist; reddish gray (5YR 5/2); silty fine to coarse sand; hard drilling
40	237.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; medium drilling
45	232.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; hard drilling
50	227.28		cuttings		dry; reddish brown (2.5YR 5/4); fine sandy silt with mudstone fragments; hard drilling
55	222.28		cuttings		dry; reddish brown (2.5YR 5/4); silt with fine to coarse mudstone fragments; hard drilling
60	217.28		cuttings		dry; reddish brown (2.5YR 4/4); medium sandy silt; medium drilling
65	212.28		cuttings		dry; pale red (2.5YR 6/2); medium sandy silt; hard drilling
70	207.28		cuttings		wet; reddish brown (2.5YR 5/4); medium sandy silt; very hard drilling
75			cuttings		wet; reddish brown (2.5YR 5/4); medium sandy silt; v. hard drilling

Well: MW-1
TOC Elev.: 280.08'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

For Internal Use ONLY:

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐Agricultural
- ☐Municipal/Public
- ☐Geothermal (Heating/Cooling Supply)
- ☐Residential Water Supply (single)
- ☐Industrial/Commercial
- ☐Residential Water Supply (shared)
- ☐Irrigation

Non-Water Supply Well:

- ☒Monitoring
- ☐Recovery

Injection Well:

- ☐Aquifer Recharge
- ☐Groundwater Remediation
- ☐Aquifer Storage and Recovery
- ☐Salinity Barrier
- ☐Aquifer Test
- ☐Stormwater Drainage
- ☐Experimental Technology
- ☐Subsidence Control
- ☐Geothermal (Closed Loop)
- ☐Tracer
- ☐Geothermal (Heating/Cooling Return)
- ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-1

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒Permanent or ☐Temporary

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 72 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: _____ (in.)

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	57' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
57' ft.	72' ft.	2' in.	.012	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	53' ft.	portland	trimmie
53' ft.	55' ft.	bentonite chips	pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
55' ft.	72' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	24' ft.	tan silty clay
24' ft.	72' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KL NOMAN 9-25-15

21. REMARKS

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor

6/25/2015
Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit, 1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program, 1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-2

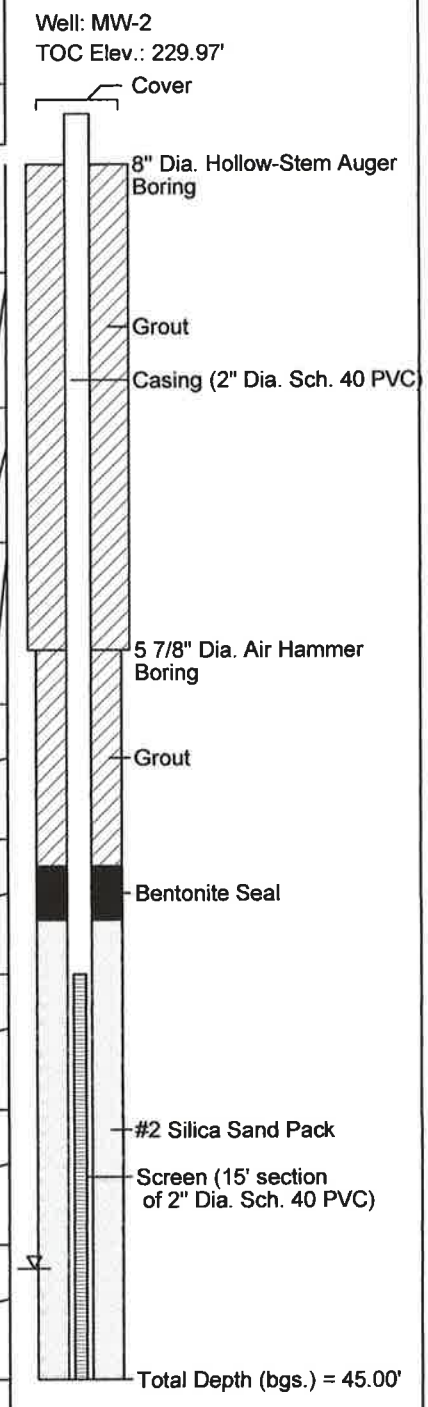
Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 6/22/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/22/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 229.97' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 227.45' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	cut

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 41.18' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	227.45				
5	222.45	50/5"	SS	6	dry; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Partially Weathered Rock
10	217.45	12 25 30	SS	16	moist; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Residuum
15	212.45	50/5"	SS	3	moist; very hard; reddish brown (2.5YR 4/4) with black and light green pods; highly horizontal fissile; very fine sandy clayey silt; cohesive; no plasticity; Partially Weathered Rock; Auger Refusal @ 18'
20	207.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
25	202.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
30	197.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
35	192.45		cuttings		dry; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; hard drilling
40	187.45		cuttings		moist; brown (7.5YR 5/3); fine to coarse sandy silt with mudstone fragments; medium drilling
45	182.45		cuttings		moist; gray (7.5 6/1); fine to coarse sandy clayey silt with mudstone fragments; medium drilling
50					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-2

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 45 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	30' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
30' ft.	45' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	26' ft.	portland	trimmie
26' ft.	28' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
28' ft.	45' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	16' ft.	tan silty clay
16' ft.	45' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-3

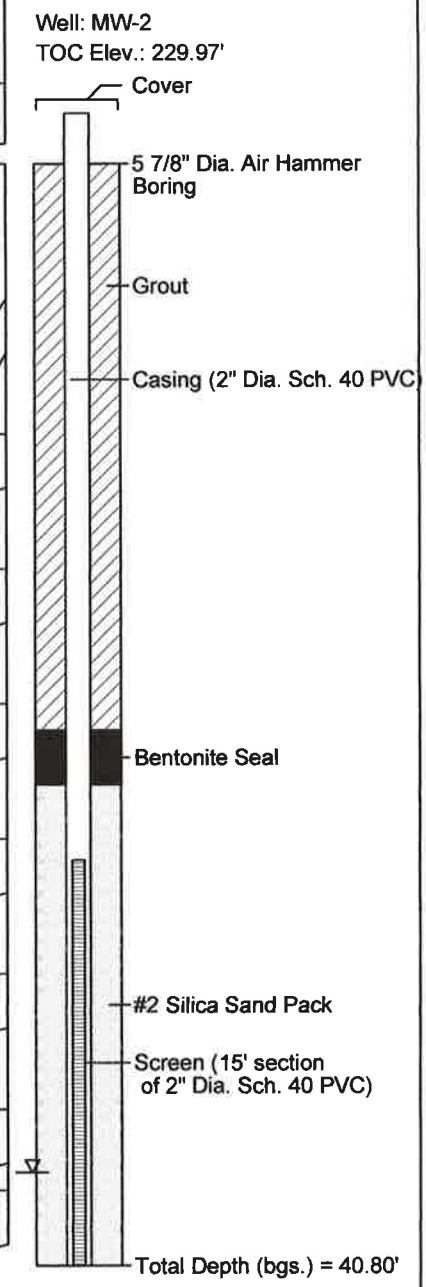
Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 6/23/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/23/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 222.56' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 220.00' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	fill; ~120' NW PZM-2/2D

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 37.10' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	220				See Boring Log PZM-2 and 2D for detailed hollow-stem auger and split spoon sampling data (attached). MW-3 is located ~120' NW of PZM-2 and 2D.
5	215		cuttings		moist; reddish yellow (7.5 YR 6/8); fine sandy clayey silt; soft drilling
10	210		cuttings		dry; brown (7.5YR 5/4); fine to medium sandy clayey silt; soft drilling
15	205		cuttings		dry; brown (7.5YR 5/3); fine to medium sandy clayey silt; soft drilling
20	200		cuttings		dry; brown (7.5YR 5/3); fine to medium sandy clayey silt; soft drilling
25	195		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
30	190		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
35	185		cuttings		moist; reddish brown (5YR 5/4) fine to medium sandy clayey silt; soft drilling
			cuttings		dry; pinkish gray (5YR 6/2); fine to medium sandy clayey silt; soft drilling
40	180				
45	175				
50					



Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-2 and 2D

Moncure Mine Reclamation Site
1315 Moncure-Flatwood Road
Moncure, North Carolina

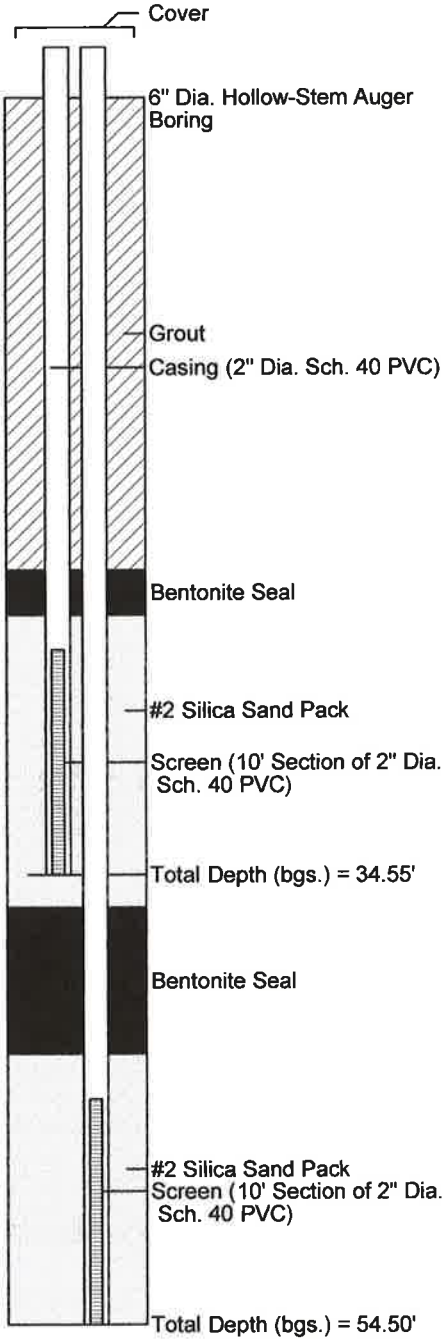
Date Started:	: 8/6/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/6/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: HPC Land Services	Top-of-Casing Elev.:	: 222.37'/222.40'
Drillers Name:	: Jason Cain	Ground Surface Elev.:	: 219.73
NC Driller Certification:	: 3112A	Natural, Cut, Fill Grade::	fill, road bed

Water Levels
- 1 Hour = 32.00' bgs/dry
- 24 Hours = 16.76'/29.49' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	219.73	9 7 13	SS	10	moist/dry; very stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly clayey silt; no plasticity; cohesive; Fill
5	214.73	4 3 6	SS	8	wet; stiff; strong brown (7.5YR 5/6) with orange mottles; quartz gravelly silty clay with brick fragments; no plasticity; cohesive; Fill
10	209.73	3 5 8	SS	16	moist; stiff; light brownish gray (10YR 6/2) with orange mottles; silty fat clay with roots; high plastcity; cohesive; Soil Horizon
15	204.73	4 11 12	SS	24	moist; very stiff; reddish brown (5YR 4/4) with black mottles; medium horizontal fissile; silty clay; low plasticity; Residuum
20	199.73	50/4"	SS	8	moist; reddish gray (5YR 5/2); highly horizontal fissile; clayey silt; no plasticity; cohesive; Partially Weathered Rock
25	194.73	50/6"	SS,BAG	10	moist; very hard; reddish gray (5YR 5/2) with green flecks; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock; (Lab Results: PZM-2 Bag (23.5-24); USCS=CL; Gravel=4.7%; Sand=19.9%; Silt=50.3%; Clay=25.1%; Effective Porosity=5%; Atterberg Limits: PL=20, LL=38, PI=18)
30	189.73	50/4"	SS	8	moist; very hard; reddish gray (5YR 5/2) with green flecks; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
35	184.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
40	179.73	50/1"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
45	174.73	50/2"	SS	6	dry; very hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50	169.73	50/3"	SS	8	dry; very hard; dark reddish gray (5/YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
55	164.73	50/3"	SS	4	dry; vary hard; dark reddish gray (5YR 4/2); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
60					

Well1: PZM-2
Well2: PZM-2D
TOC Elev.:



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐ Agricultural ☐ Municipal/Public
☐ Geothermal (Heating/Cooling Supply) ☐ Residential Water Supply (single)
☐ Industrial/Commercial ☐ Residential Water Supply (shared)
☐ Irrigation

Non-Water Supply Well:
☒ Monitoring ☐ Recovery

Injection Well:
☐ Aquifer Recharge ☐ Groundwater Remediation
☐ Aquifer Storage and Recovery ☐ Salinity Barrier
☐ Aquifer Test ☐ Stormwater Drainage
☐ Experimental Technology ☐ Subsidence Control
☐ Geothermal (Closed Loop) ☐ Tracer
☐ Geothermal (Heating/Cooling Return) ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/22/2015 **Well ID#** MW-3

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

Chatham
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒ **Permanent** or ☐ **Temporary**

7. Is this a repair to an existing well: ☐ **Yes** or ☒ **No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 40 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	25' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
25' ft.	40' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	~~20'~~ 21' ft.	portland	trimmie
21' ft.	23' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
23' ft.	40' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	40' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

21. REMARKS

22. Certification:

Steve Poloniewicz — 6/25/2015
Signature of Certified Well Contractor — Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-1 / MW-4

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

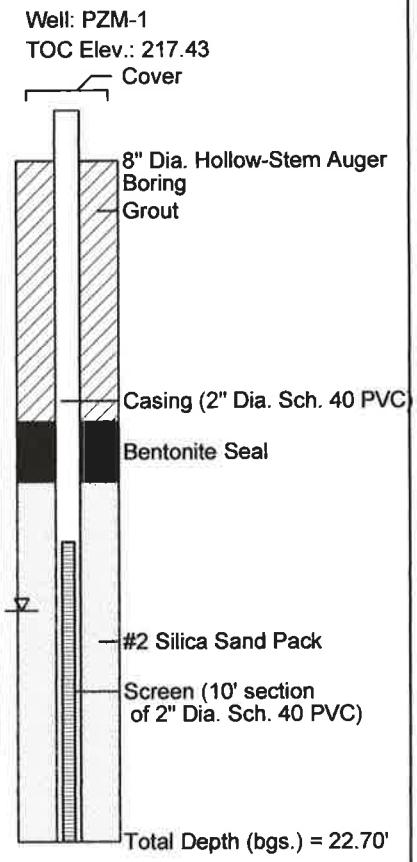
Date Started:	: 8/13/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 8/13/14	Drilling Method:	: Geoprobe 8049DT
Drilling Company:	: Geologic Exploration	Top-of-Casing Elev.:	: 217.13'(Lawrence Survey)
Drillers Name:	: Johnny Burr	Ground Surface Elev.:	: 214.49'(Lawrence Survey)
NC Driller Certification:	: 3098A	Natural, Cut, Fill Grade:	: Fill (road bed)

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = 15.00' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	214.49	4 14 12	SS	14	moist; very stiff; reddish yellow (7.5YR 6/6) with orange, yellow and light gray mottled; fine sandy silty clay with quartz gravel; low plasticity; cohesive; Fill
5	209.49	4 5 6	SS	9	moist; stiff; strong brown (7.5YR 5/6) with light gray and brown mottled; medium sandy silty clay with brick and quartz gravel; medium plasticity; cohesive; Fill
10	204.49	7 5 4	SS,BAG	12	moist; stiff; gray (5YR 6/1) with light orange mottles; very fine sandy coarse silty clay; low plasticity; cohesive; Flood Plain; (Lab Results: PZ-1 Bag (9-10.5'); USCS=CL; Gravel=0.3%; Sand=33.4%; Silt=38.7%; Clay=27.6%; Effective Porosity=5%; Atterberg Limits: PL=18; LL=34, PI=16)
15	199.49	7 10 50/5"	SS,BAG	13	moist/wet; reddish brown (5YR 4/3) with gray mottles; fine sandy silty clay; medium plasticity; cohesive; Residuum; (Lab Results: PZM-1 Bag (14.5-16'); USCS=CL; Gravel=0.1%; Sand=49.6%; Silt=33.1; Clay=17.2%; Effective Porosity=14%; Atterberg Limits: PL=16; LL=24; PI=8)
20	194.49	16 50/2"	SS	6	dry; light gray (5YR 7/1); horizontal fissle weathered mudstone; Partially Weathered Rock
25	189.49				
30	184.49				
35	179.49				
40	174.49				
45					

Auger Refusal @ 22.7'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

JOHNNY BURR

Well Contractor Name

A - 3098

NC Well Contractor Certification Number

GEOLOGIC EXPLORATION, INC

Company Name

2. Well Construction Permit #: _____

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public

☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)

☐Industrial/Commercial ☐Residential Water Supply (shared)

☐Irrigation

Non-Water Supply Well:

☑Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation

☐Aquifer Storage and Recovery ☐Salinity Barrier

☐Aquifer Test ☐Stormwater Drainage

☐Experimental Technology ☐Subsidence Control

☐Geothermal (Closed Loop) ☐Tracer

☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 08/13/14 **Well ID#** PZM-1 / MW-4 CSR

5a. Well Location:

MONCURE MINE

Facility/Owner Name

Facility ID# (if applicable)

1315 MONCURE-FLATWOOD ROAD MONCURE 27559

Physical Address, City, and Zip

CHATHAM

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35° 38' 36.98" N 79° 00' 04.99" W

6. Is (are) the well(s): ☑**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 22.0 (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: 10.0 (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8.0 (in.)

12. Well construction method: AUGER

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	12.0 ft.	2.0 in.	SCH 40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
12.0 ft.	22.0 ft.	2.0 in.	.010	SCH 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0.0 ft.	8.0 ft.	PORTLAND BENTONITE	SLURRY
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
10.0 ft.	22.0 ft.	20-40	FINE SILICA SAND
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	22.0 ft.	BROWN PWR
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

BENTONITE SEAL FROM 8.0 TO 10.0 FEET

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLNOLAN

22. Certification:

Johnny Burr

Signature of Certified Well Contractor

08/18/14

Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-22 / MW-5

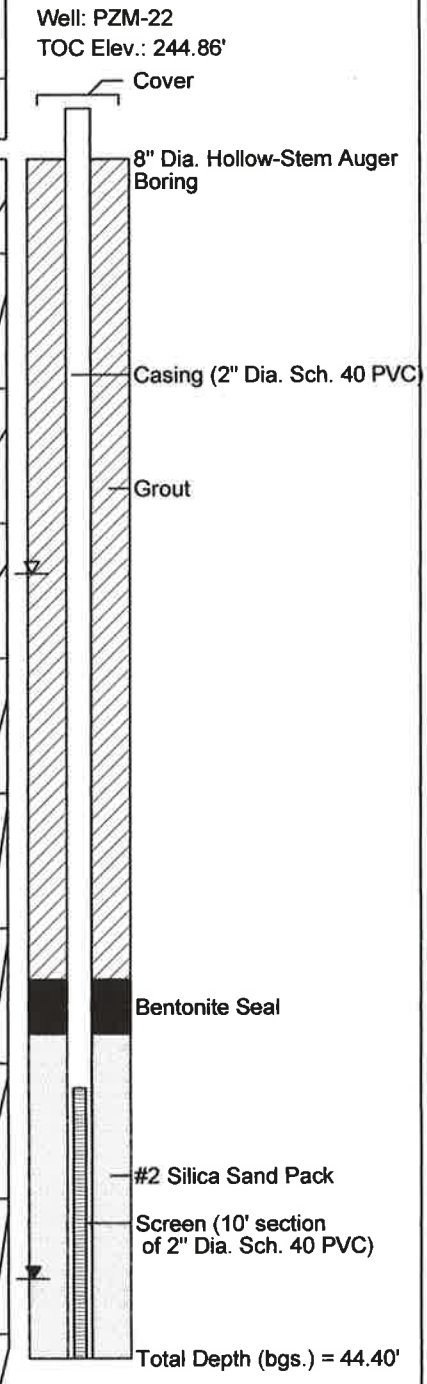
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 11/25/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 11/25/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 244.86'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 242.72'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natural

Water Levels
1 Hour = 43.60' bgs
24 Hours = 17.50' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	242.72	0 0 3	SS	20	wet; very soft; brownish yellow (10YR 6/8); silty clay with organic matter; high plasticity; cohesive; Soil Horizon
5	237.72	4 4 5	SS	12	very moist; stiff; brownish yellow (10YR 6/8) with rust stringers; silty clay with organic matter; high plasticity; cohesive; Soil Horizon
10	232.72	5 7 8	SS	16	moist; stiff; light gray (5Y 7/1) with light orange and rust specks and mottles; silty clay; medium plasticity; cohesive; Soil Horizon
15	227.72	14 22 34	SS	22	moist; very hard; weak red (10R 4/3) with light green and brown mottles; blocky; silty clay; no plasticity; cohesive; Residuum
20	222.72	14 18 22	SS	23	moist; hard; weak red (10R 4/3) with light green and rust mottles; blocky horizontal fissile; silty clay; no plasticity; cohesive; Residuum
25	217.72	50/6"	SS	12	dry; very hard; reddish brown (5YR 5/3) with light gray mottles; highly horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
30	212.72	50/5"	SS	6	dry; very hard; reddish brown (5YR 5/3) with light gray mottles; wavey horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
35	207.72	50/2"	SS	6	moist; very hard; pinkish gray (7.5YR 6/2); medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
40	202.72	50/5"	SS	6	dry; very hard; light yellowish brown (2.5Y 6/3); medium horizontal fissile; fine to medium sandy silt; no plasticity; cohesive; Partially Weathered Rock
45	197.72	50/5"	SS	4	moist; very hard; dark gray (2.5Y 4/1); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
50					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Cassell jr.

Well Contractor Name

4143-A

NC Well Contractor Certification Number

Summit-ECS

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public

☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)

☐Industrial/Commercial ☐Residential Water Supply (shared)

☐Irrigation

Non-Water Supply Well:

☑Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation

☐Aquifer Storage and Recovery ☐Salinity Barrier

☐Aquifer Test ☐Stormwater Drainage

☐Experimental Technology ☐Subsidence Control

☐Geothermal (Closed Loop) ☐Tracer

☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 11/25/14 **Well ID#** pzm-22/mw-5 OTK

5a. Well Location:

Facility/Owner Name _____ Facility ID# (if applicable) _____

1315 Moncure-Flatwood rd.

Physical Address, City, and Zip

Chatham

County _____ Parcel Identification No. (PIN) _____

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 44' (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8.25" (in.)

12. Well construction method: HSA

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
34.0' ft.	+2' ft.	2" in.	.040	pvc
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
44.0' ft.	34.0' ft.	2" in.	.010	.040	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
32.0' ft.	30.0' ft.	bent.	well seal
30.0' ft.	0.0' ft.	port.	trimmie
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
44.0' ft.	32.0' ft.	well sand	trickle down
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1.4 ft.	top soil
1.4 ft.	ft.	
ft.	6.0 ft.	tan fi sa si
6.2 ft.	ft.	brn, reddish tri si
ft.	ft.	
ft.	ft.	
ft.	45.0' ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN

22. Certification:

Signature of Certified Well Contractor _____ Date 12-15-14

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:

Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-6

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

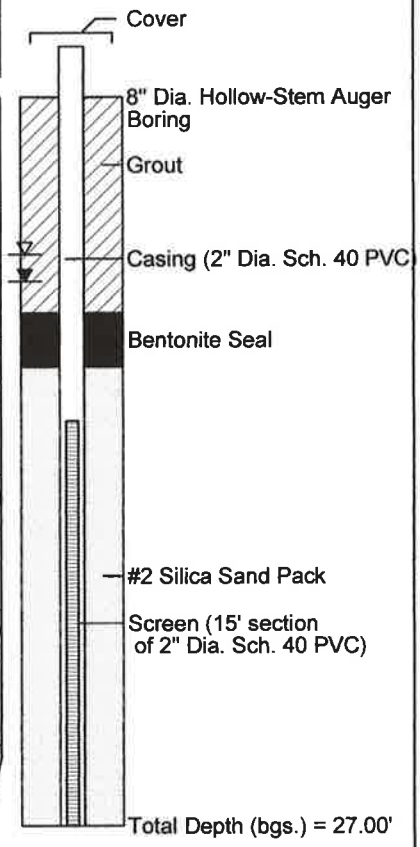
Date Started:	: 6/23/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/23/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 231.10'(McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 228.63'(McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	Natural

Water Levels
- 1 Hour = 6.40' bgs
- 24 Hours = 5.40' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	228.63				
5	223.63	9 20 24	SS	14	moist; hard; reddish brown (2.5YR 4/3); horizontal fissile; weathered mudstone and clayey silt; cohesive; no plasticity; Residuum
10	218.63	11 31 15	SS	16	dry; hard; weak red (10R 5/3) with horizontal orange tan and light green bands; silty clay; cohesive; medium plasticity; Residuum
15	213.63	50/5"	SS	6	moist; very hard; dusky red (2.5YR 3/2) with fine light grat and tan specks; clayey fine to coarse sandy silt; no cohesion or plasticity; Partially Weathered Rock
20	208.63	50/3"	SS	6	dry; very hard; weak red (2.5YR 5/2); weathered mudstone; Partially Weathered Rock
25	203.63	50/3"	SS	5	wet; very hard; weak red (2.5YR 5/2); weathered mudstone; Partially Weathered Rock
30	198.63				
35	193.63				
40	188.63				
45	183.63				
50					

Well: MW-6
TOC Elev.: 231.10'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/23/2015 **Well ID#** MW-6

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 26 **(ft.)**
For multiple wells list all depths if different (example: 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	12' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
12' ft.	27' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	8' ft.	portland	trimmie
8' ft.	10' ft.	bentonite chips	pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
10' ft.	27' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	27' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 9-25-15

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-27 / MW-7

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

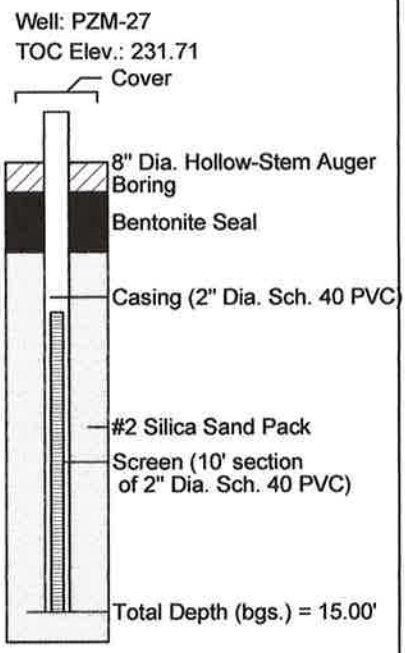
Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 231.71'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 229.53'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natual

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	229.53	1 2 3	SS	15	moist; medium; yellowish brown (10YR 5/6) with light orange mottles; silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	224.53	6 9 12	SS	14	moist; very stiff; dark reddish brown (2.5YR 3/3) with dark gray and white specks; fine to medium sandy silty clay; low plasticity; cohesive; Residuum
10	219.53	25 50/3"	SS	12	dry; very hard; reddish gray (2.5YR 5/1) with light orange and rust mottles; slightly clayey ine to medium sand; no plasticity; cohesive; Partially Weathered Rock
15	214.53	50/4"	SS	6	moist; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; fine to medium sandy clayey silt; very hard drilling 11-13'; no plasticity; cohesive; Partially Weathered Rock
20	209.53				
25	204.53				
30	199.53				
35	194.53				
40	189.53				
45					

Auger Refusal @ 16'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Cassell jr.

Well Contractor Name

4143-A

NC Well Contractor Certification Number

Summit-ECS

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐Agricultural
- ☐Municipal/Public
- ☐Geothermal (Heating/Cooling Supply)
- ☐Residential Water Supply (single)
- ☐Industrial/Commercial
- ☐Residential Water Supply (shared)
- ☐Irrigation

Non-Water Supply Well:

- ☑Monitoring
- ☐Recovery

Injection Well:

- ☐Aquifer Recharge
- ☐Groundwater Remediation
- ☐Aquifer Storage and Recovery
- ☐Salinity Barrier
- ☐Aquifer Test
- ☐Stormwater Drainage
- ☐Experimental Technology
- ☐Subsidence Control
- ☐Geothermal (Closed Loop)
- ☐Tracer
- ☐Geothermal (Heating/Cooling Return)
- ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 12/2/14 **Well ID#** pzm-27 / mw-7 CZK

5a. Well Location:

Facility/Owner Name _____ Facility ID# (if applicable) _____

1315 Moncure-Flatwood rd.

Physical Address, City, and Zip

Chatham

County _____ Parcel Identification No. (PIN) _____

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☑No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 15.0' **(ft.)**

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**

If water level is above casing, use "+"

11. Borehole diameter: 8.25" **(in.)**

12. Well construction method: HSA

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
5.0' ft.	+2' ft.	2" in.	.040	pvc
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15.0' ft.	5.0' ft.	2" in.	.010	.040	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
3.0' ft.	2.0' ft.	bent.	well seal
2.0' ft.	0.0' ft.	port.	trimmie
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
15.0' ft.	3.0' ft.	well sand	trickle down
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	.7 ft.	top soil
.7 ft.	ft.	
ft.	4.0 ft.	tan fi sa si
4.2 ft.	ft.	brn, reddish , tri si
ft.	ft.	
ft.	ft.	
ft.	15.0' ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLNOMAN

22. Certification:

Signature of Certified Well Contractor _____ Date 12-15-14

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:

Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, MW-8

Brickhaven No. 2 Mine Tract "A'
1271 Moncure-Flatwood Road
Moncure, North Carolina

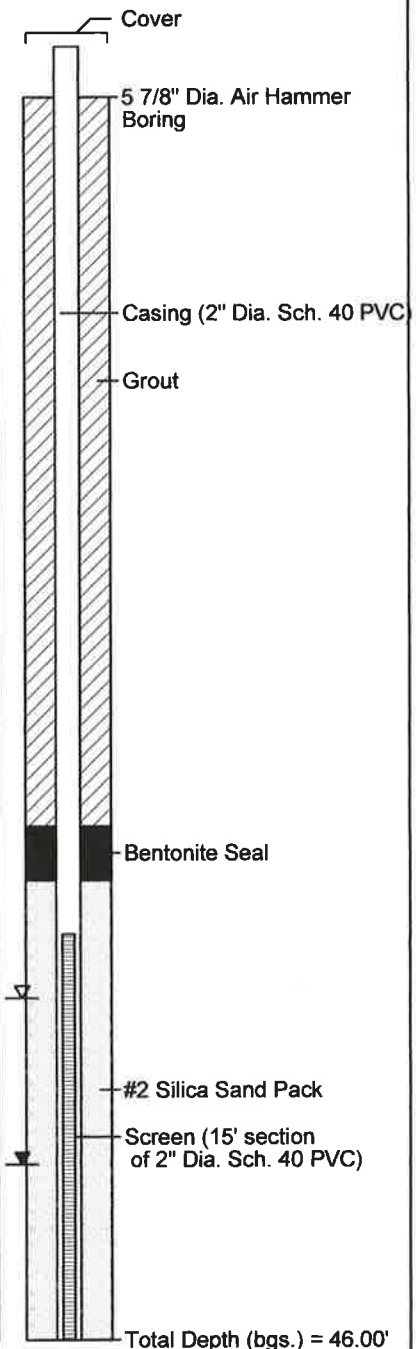
Date Started:	: 6/24/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 6/24/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 236.47' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 233.41' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	natural; 15' N. PZM-28

Water Levels
▼ 1 Hour = 39.50' bgs
▽ 24 Hours = 33.36' bgs

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	233.41				See Boring Log PZM-28 for detailed hollow-stem auger and split spoon sampling data from 0-24' bgs (attached). MW-8 is located 15' N. of PZM-28.
5	228.41				
10	223.41				
15	218.41				
20	213.41				
25	208.41		cuttings		dry; yellowish red (5YR 5/6); silty mudstone fragments; medium hard drilling
30	203.41		cuttings		dry; reddish brown (5YR 5/4); sandy clayey silt with mudstone fragments; soft drilling
35	198.41		cuttings		dry; reddish brown (5YR 5/4); sandy clayey silt with mudstone fragments; medium hard drilling
40	193.41		cuttings		wet; reddish brown (5YR 4/3); medium sand silt with mudstone fragments; soft drilling
45	188.41		cuttings		wet; reddish brown (5YR 4/3); medium sand silt with mudstone fragments; hard drilling
50					

Well: MW-8
TOC Elev.: 236.47'



Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, PZM-28 (Adjacent to MW-8)

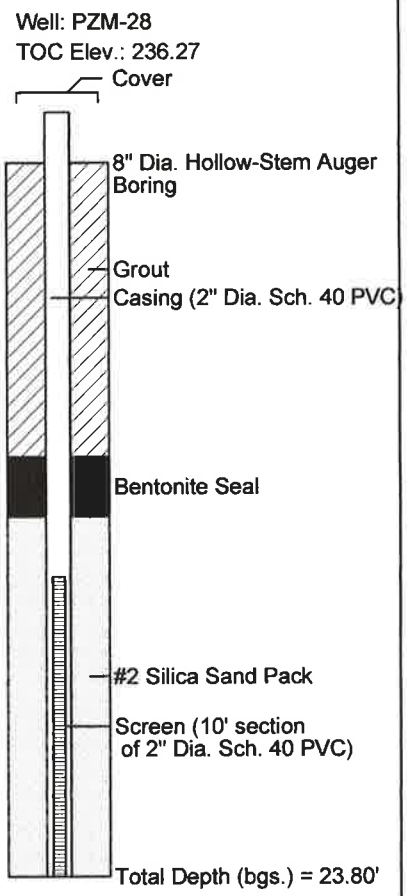
Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

Date Started:	: 12/2/14	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 12/2/14	Drilling Method:	: HSA; CME-550
Drilling Company:	: Summit Engineering	Top-of-Casing Elev.:	: 236.12'(Lawrence Survey)
Drillers Name:	: Robert Cassell	Ground Surface Elev.:	: 234.12'(Lawrence Survey)
NC Driller Certification:	: 4143A	Natural, Cut, Fill Grade::	natual; 15' S. MW-8

Water Levels
▼ 1 Hour = dry
▽ 24 Hours = dry

Sample Type
SS = Split Spoon
ST = Shelby Tube
RC = Rock Core
BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	234.12	3 4 7	SS	22	moist; stiff; yellowish red (5YR 5/6) with orange mottles; fine sandy silty clay with roots; medium plasticity; cohesive; Soil Horizon
5	229.12	16 17 26	SS	18	moist/dry; very hard; reddish brown (5YR 4/4); clayey silt; no plasticity; cohesive; Residuum
10	224.12	16 50/6"	SS	12	moist; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; medium horizontal fissile; silty clay; no plasticity; cohesive; Partially Weathered Rock
15	219.12	50/6"	SS	5	dry; very hard; dark reddish brown (2.5YR 3/4) with light gray green pods; highly horizontal fissile; weathered mudstone; Partially Weathered Rock
20	214.12	50/3"	SS	2	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
25	209.12	50/3"	SS	4	dry; very hard; dark reddish brown (2.5YR 3/4); highly horizontal fissile; weathered mudstone; Partially Weathered Rock
30	204.12				
35	199.12				
40	194.12				
45					



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

- ☐ Agricultural
- ☐ Municipal/Public
- ☐ Geothermal (Heating/Cooling Supply)
- ☐ Residential Water Supply (single)
- ☐ Industrial/Commercial
- ☐ Residential Water Supply (shared)
- ☐ Irrigation

Non-Water Supply Well:

- ☒ Monitoring
- ☐ Recovery

Injection Well:

- ☐ Aquifer Recharge
- ☐ Groundwater Remediation
- ☐ Aquifer Storage and Recovery
- ☐ Salinity Barrier
- ☐ Aquifer Test
- ☐ Stormwater Drainage
- ☐ Experimental Technology
- ☐ Subsidence Control
- ☐ Geothermal (Closed Loop)
- ☐ Tracer
- ☐ Geothermal (Heating/Cooling Return)
- ☐ Other (explain under #21 Remarks)

4. Date Well(s) Completed: 06/24/2015 **Well ID#** MW-8

5a. Well Location:

Green Meadows LLC c/o Buxton Environmental
Facility/Owner Name — Facility ID# (if applicable)

1315 Moncure Flatwood Rd, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.594601 N 79.011080 W

6. Is (are) the well(s): ☒ Permanent or ☐ Temporary

7. Is this a repair to an existing well: ☐ Yes or ☒ No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 46 (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ (ft.)
If water level is above casing, use "+"

11. Borehole diameter: _____ (in.)

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	31' ft.	2' in.	sch 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
31' ft.	46' ft.	2' in.	.010	sch 40	pvc
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1' ft.	27' ft.	portland	trimmie
27' ft.	29' ft.	bentonite chips	pwr
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
29' ft.	46' ft.	silica sand	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0.0 ft.	15' ft.	tan silty clay
15' ft.	46' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KL NOMAN 6-25-15

21. REMARKS

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor — Date: 6/25/2015

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Buxton Environmental, Inc.
Consulting Services
1101 South Blvd., Suite 101
Charlotte, North Carolina 28203
Ph (704) 344-1450 Fax (704) 344-1451
buxtonenv@bellsouth.net

Boring Log, BG-1

Brickhaven No. 2 Mine Tract "A"
1271 Moncure-Flatwood Road
Moncure, North Carolina

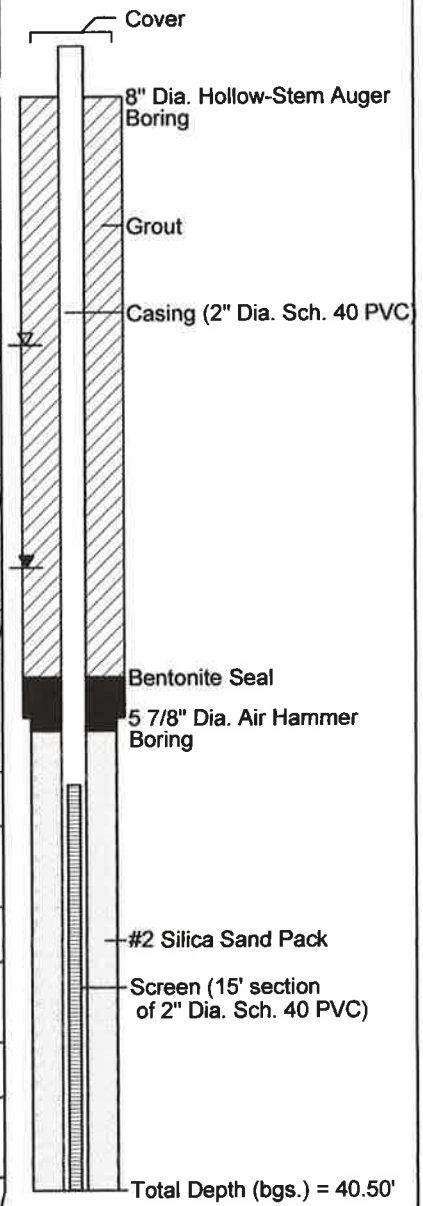
Date Started:	: 7/30/15	Logged By:	: Ross Klingman, P.G.
Date Completed:	: 7/30/15	Drilling Method:	: Guspech-Brutt GP-1100E
Drilling Company:	: SAEDACCO, Inc.	Top-of-Casing Elev.:	: 228.19' (McAdams Survey)
Drillers Name:	: Steve Poloniewicz	Ground Surface Elev.:	: 225.64' (McAdams Survey)
NC Driller Certification:	: 2284A	Natural, Cut, Fill Grade::	natural

Water Levels
- 1 Hour = 16.50' bgs
- 24 Hours = 9.00' bgs

Sample Type
- SS = Split Spoon
- ST = Shelby Tube
- RC = Rock Core
- BAG = Bag Sample

Depth (feet bgs.)	Elevation (feet asl.)	Blow Count/6-inches	Sampler Type	Recovery (in.)	Lithologic Description
0	225.64				
5	220.64	4 5 5	SS	16	moist; medium; pinkish gray (7.5YR 6/2) with light orange mottles; fine sandy silty clay; cohesive; high plasticity; Soil Horizon
10	215.64	50/4"	SS	3	dry; very hard; dark red (2.5YR 3/6); medium horizontal fissile; weathered mudstone; Partially Weathered Rock
15	210.64	50/2"	SS	3	dry; very hard; dark red (2.5YR 3/6) with gray horizontal bands; silty fine to coarse sand and muddy sandstone gravel; Partially Weathered Rock
20	205.64	50/4"	SS	6	dry; very hard; weak red (10YR 5/3); horizontal fissile; sandy mudstone; Partially Weathered Rock; Auger Refual @ 23'
25	200.64		cuttings		dry; red (10R 4/6); silt with mudstone fragments; hard drilling
30	195.64		cuttings		dry; red (10R 5/6); silt with mudstone fragments; medium hard drilling
35	190.64		cuttings		dry; red (10R 5/6); silt with mudstone fragments; medium hard drilling
40	185.64		cuttings		dry; weak red (10R 5/3); silt with mudstone fragments; hard drilling
45	180.64				
50					

Well: BG-1
TOC Elev.: 228.19'



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Steve Poloniewicz
Well Contractor Name

2284-A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 07/30/2015 **Well ID#** BG-1

5a. Well Location:

Moncure Clay MIne
Facility/Owner Name
Facility ID# (if applicable)

1315 Moncure-Flatwood Road, Moncure, NC, 27559
Physical Address, City, and Zip

U.S
County
Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 41 **(ft.)**
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: _____ **(in.)**

12. Well construction method: _____
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0.0 ft.	26' ft.	2' in.	SCH 40	pvc

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
26' ft.	41' ft.	2' in.	.010	SCH 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0.0 ft.	22' ft.	portland cementmmie	
22' ft.	24' ft.	bentonite chipper	
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
24' ft.	41' ft.	SILICA SAND	#2
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
o.o ft.	20' ft.	red silty clay
20' ft.	41' ft.	pwr
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

NORTH CAROLINA LICENSED SEAL 1266 GEOLOGIST CHARLES ROSS KLINGMAN 9-25-15

22. Certification:

Steve Poloniewicz
Signature of Certified Well Contractor

7/31/2015
Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

D

Appendix D – Slug Tests

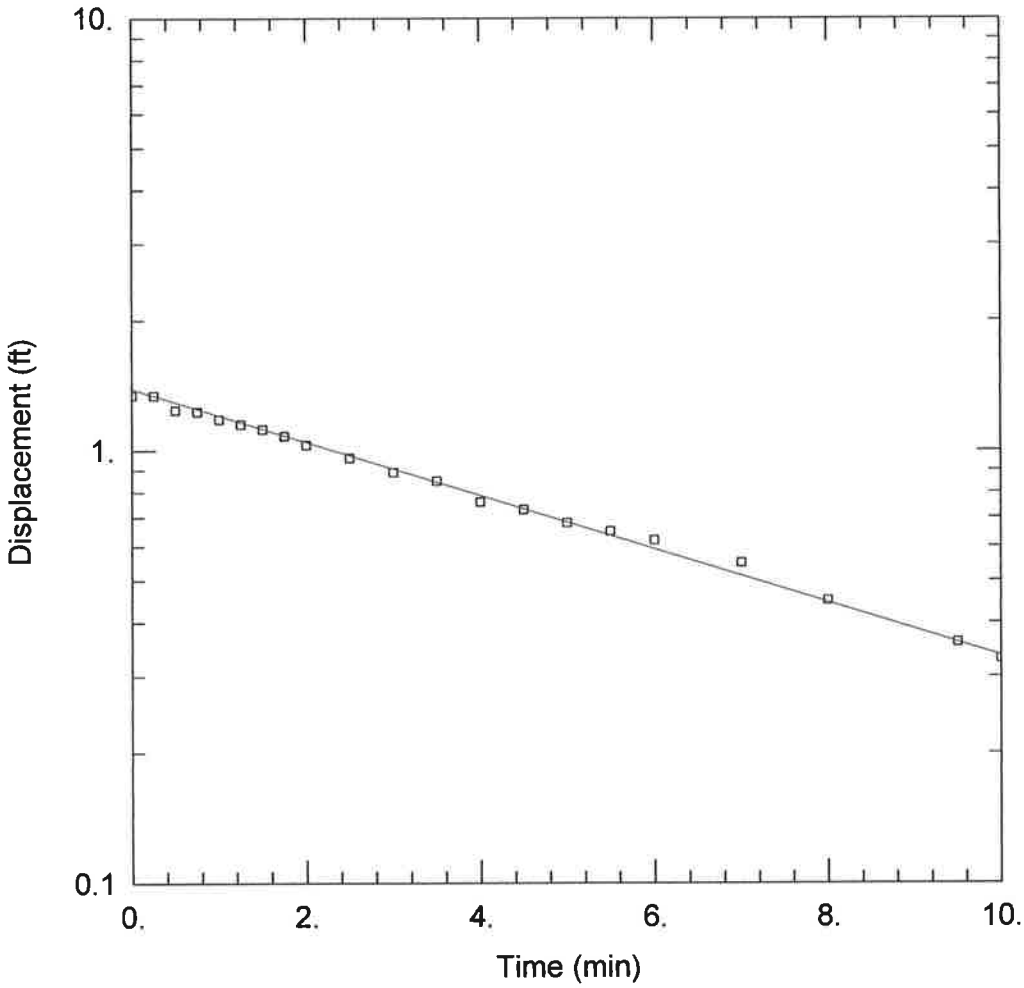
BG-1
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.34'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 40.50'
Total Depth Well Below Top-of-Casing (BTOC): 43.05'
Static Depth-to-Water BTOC: 12.46'
Static Height of Water in Well: 30.59'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	12.46		
0.25	13.80	12.46	1.34
0.50	13.70	12.46	1.24
0.75	13.69	12.46	1.23
1.00	13.64	12.46	1.18
1.25	13.61	12.46	1.15
1.50	13.58	12.46	1.12
1.75	13.54	12.46	1.08
2.00	13.49	12.46	1.03
2.50	13.42	12.46	0.96
3.00	13.35	12.46	0.89
3.50	13.31	12.46	0.85
4.00	13.22	12.46	0.76
4.50	13.19	12.46	0.73
5.00	13.14	12.46	0.68
5.50	13.11	12.46	0.65
6.00	13.08	12.46	0.62
7.00	13.01	12.46	0.55
8.00	12.91	12.46	0.45
9.50	12.82	12.46	0.36
10.00	12.79	12.46	0.33

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.BG-1



RISING HEAD SLUG TEST - BG-1

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickBG-1.aqt
Date: 09/28/15 Time: 16:44:11

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: BG-1
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 30.59 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.34 ft
Total Well Penetration Depth: 40.5 ft
Casing Radius: 0.083 ft
Static Water Column Height: 30.59 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 7.761E-5 cm/sec
y0 = 1.389 ft

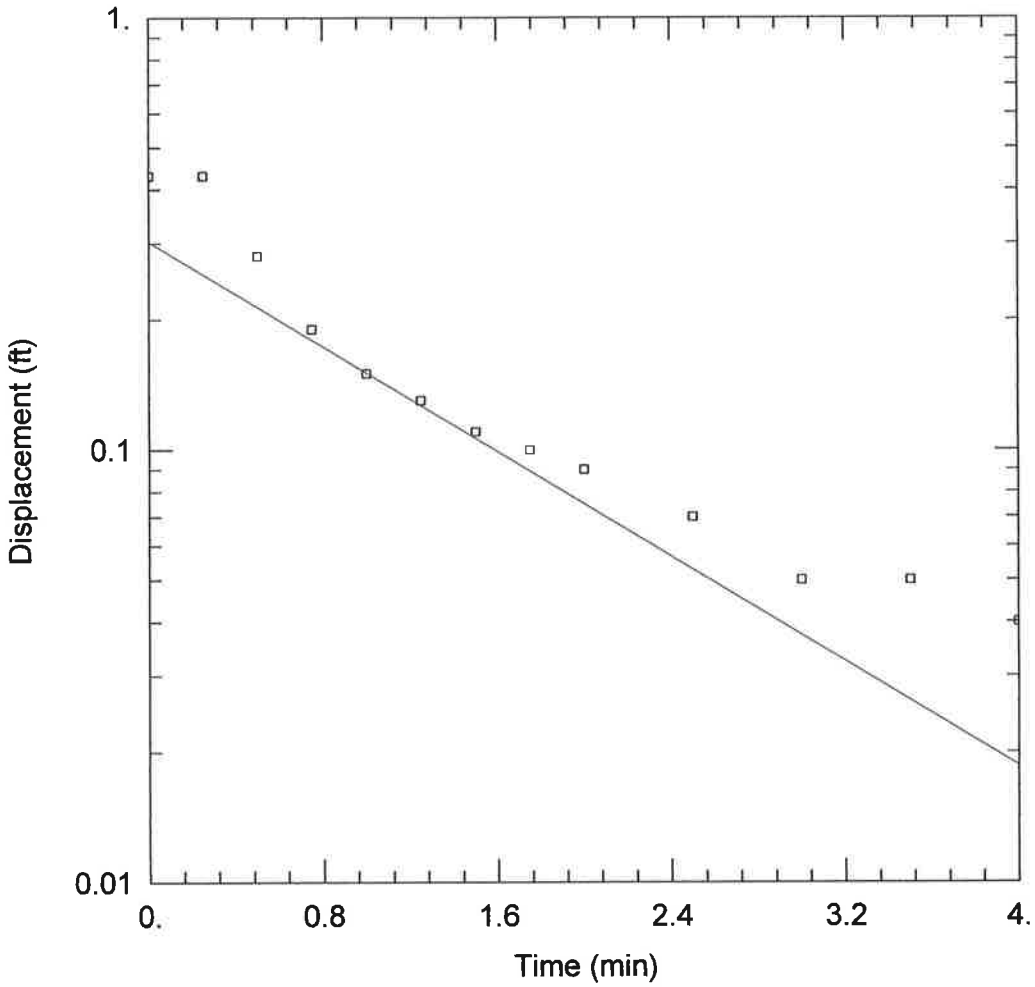
MW-1
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.43'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 72.50'
Total Depth Well Below Top-of-Casing (BTOC): 75.30'
Static Depth-to-Water BTOC: 59.97'
Static Height of Water in Well: 15.33'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	59.97		
0.25	60.40	59.97	0.43
0.50	60.25	59.97	0.28
0.75	60.16	59.97	0.19
1.00	60.12	59.97	0.15
1.25	60.10	59.97	0.13
1.50	60.08	59.97	0.11
1.75	60.07	59.97	0.10
2.00	60.06	59.97	0.09
2.50	60.04	59.97	0.07
3.00	60.02	59.97	0.05
3.50	60.02	59.97	0.05
4.00	60.01	59.97	0.04

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (2) bailers of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-1



RISING HEAD SLUG TEST - MW-1

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-1.aqt
Date: 09/28/15 Time: 15:57:06

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-1
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 15.33 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.43 ft
Total Well Penetration Depth: 72.5 ft
Casing Radius: 0.083 ft
Static Water Column Height: 15.33 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0004105 cm/sec
y0 = 0.3027 ft

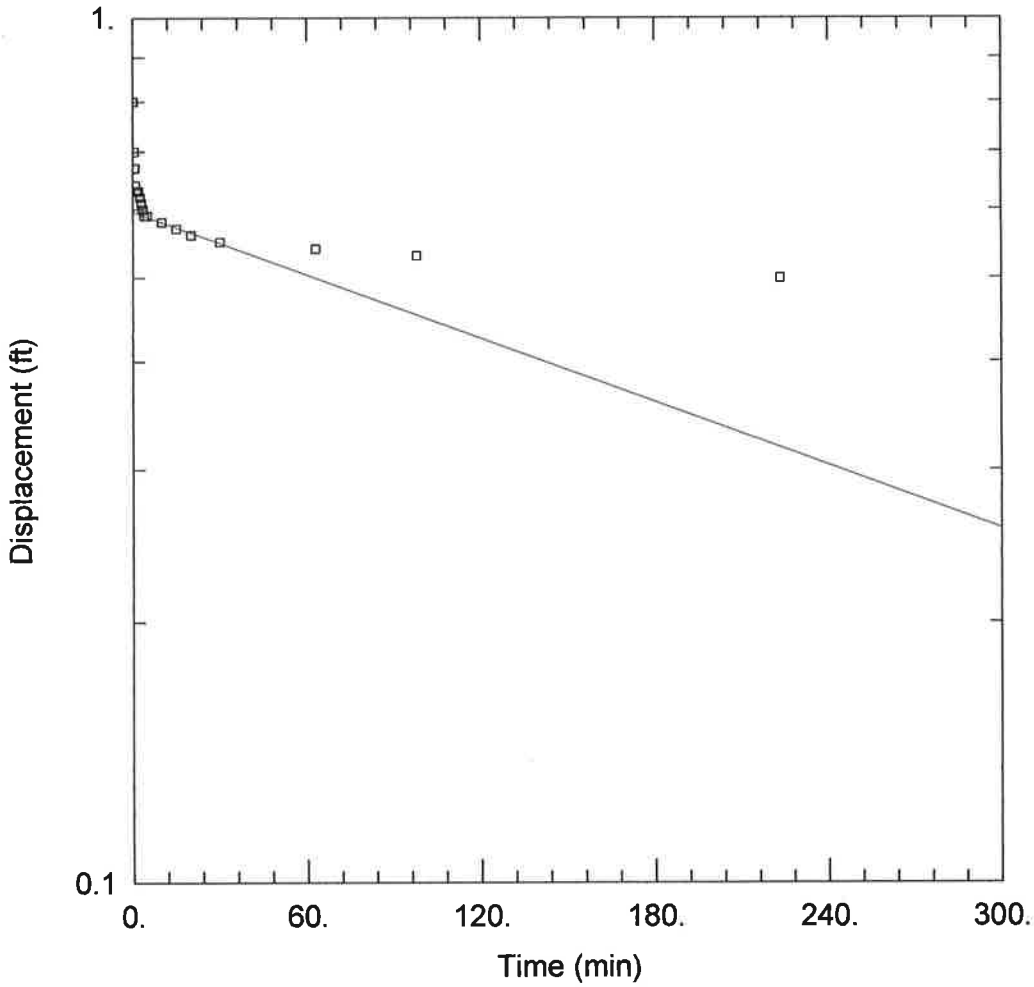
MW-2
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.80'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 45.00'
Total Depth Well Below Top-of-Casing (BTOC): 47.52'
Static Depth-to-Water BTOC: 40.98'
Static Height of Water in Well: 6.54'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	40.98		
0.25	41.78	40.98	0.80
0.50	41.68	40.98	0.70
0.75	41.65	40.98	0.67
1.00	41.62	40.98	0.64
1.50	41.61	40.98	0.63
2.00	41.61	40.98	0.63
2.50	41.60	40.98	0.62
3.00	41.59	40.98	0.61
3.50	41.58	40.98	0.60
4.00	41.57	40.98	0.59
5.00	41.57	40.98	0.59
10.00	41.56	40.98	0.58
15.00	41.55	40.98	0.57
20.00	41.54	40.98	0.56
30.00	41.53	40.98	0.55
63.00	41.52	40.98	0.54
98.00	41.51	40.98	0.53
223.00	41.48	40.98	0.50

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-2



RISING HEAD SLUG TEST - MW-2

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-1.aqt
Date: 09/28/15 Time: 16:02:26

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-2
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 6.54 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.8 ft
Total Well Penetration Depth: 45. ft
Casing Radius: 0.083 ft
Static Water Column Height: 6.54 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 3.405E-6 cm/sec
y0 = 0.5962 ft

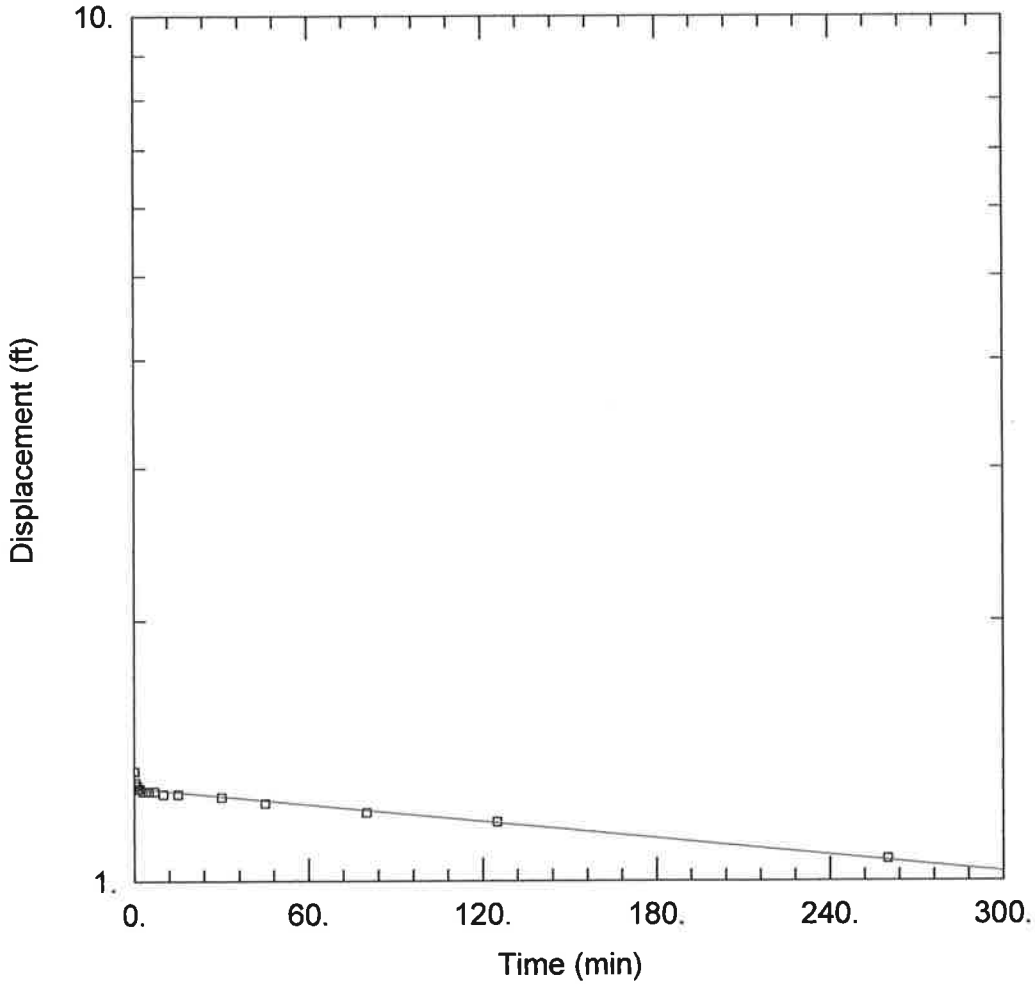
MW-3
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.34'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 40.80'
Total Depth Well Below Top-of-Casing (BTOC): 43.36'
Static Depth-to-Water BTOC: 15.55'
Static Height of Water in Well: 27.81'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	15.55		
0.25	16.89	15.55	1.34
0.50	16.85	15.55	1.30
0.75	16.84	15.55	1.29
1.00	16.84	15.55	1.29
1.50	16.83	15.55	1.28
2.00	16.83	15.55	1.28
3.00	16.82	15.55	1.27
4.00	16.82	15.55	1.27
5.00	16.82	15.55	1.27
7.00	16.82	15.55	1.27
10.00	16.81	15.55	1.26
15.00	16.81	15.55	1.26
30.00	16.80	15.55	1.25
45.00	16.78	15.55	1.23
80.00	16.75	15.55	1.20
125.00	16.72	15.55	1.17
260.00	16.61	15.55	1.06

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-3



RISING HEAD SLUG TEST - MW-3

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-3.aqt
Date: 09/28/15 Time: 16:12:02

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-3
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 27.81 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.34 ft
Total Well Penetration Depth: 40.8 ft
Casing Radius: 0.083 ft
Static Water Column Height: 27.81 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 4.076E-7 cm/sec
y0 = 1.281 ft

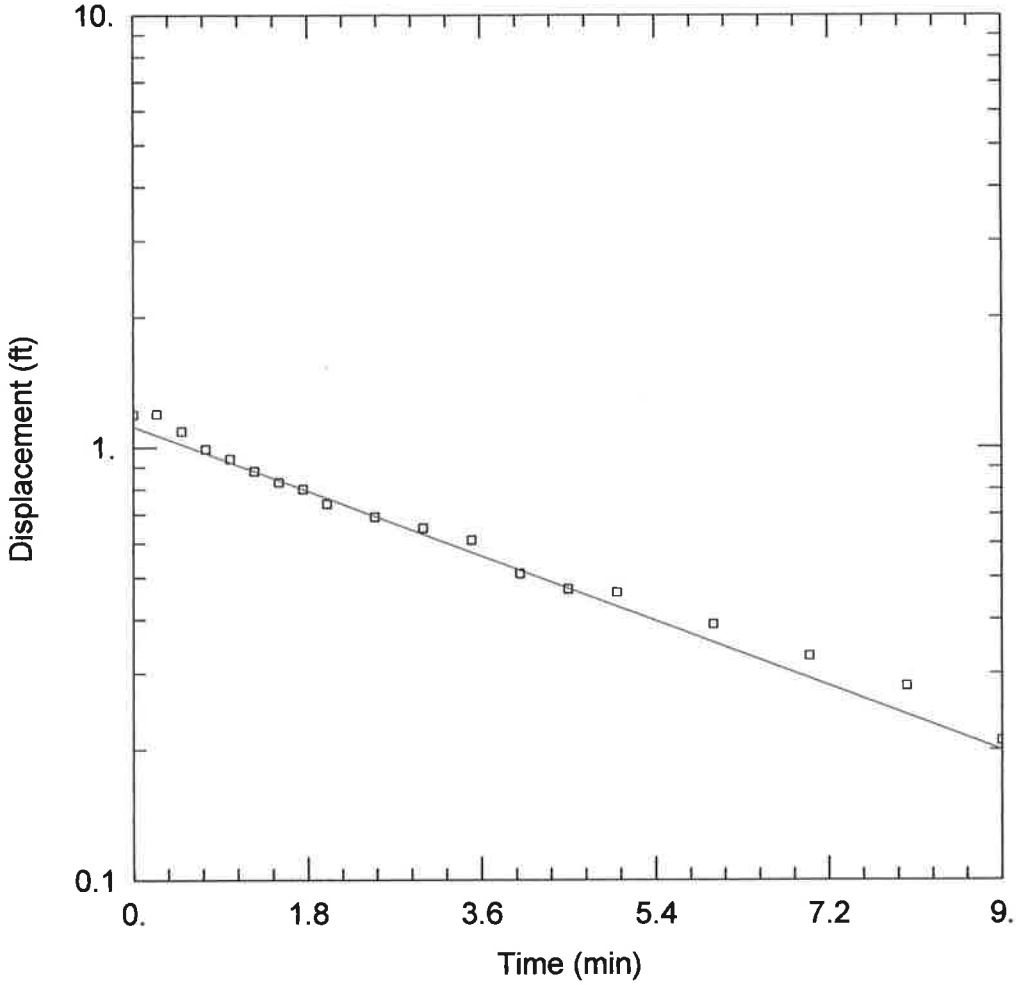
PZM-1 / MW-4
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.19'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 22.70'
Total Depth Well Below Top-of-Casing (BTOC): 25.65'
Static Depth-to-Water BTOC: 11.61'
Static Height of Water in Well: 14.04'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	11.61		
0.25	12.80	11.61	1.19
0.50	12.70	11.61	1.09
0.75	12.60	11.61	0.99
1.00	12.55	11.61	0.94
1.25	12.49	11.61	0.88
1.50	12.44	11.61	0.83
1.75	12.41	11.61	0.80
2.00	12.35	11.61	0.74
2.50	12.30	11.61	0.69
3.00	12.26	11.61	0.65
3.50	12.22	11.61	0.61
4.00	12.12	11.61	0.51
4.50	12.08	11.61	0.47
5.00	12.07	11.61	0.46
6.00	12.00	11.61	0.39
7.00	11.94	11.61	0.33
8.00	11.89	11.61	0.28
9.00	11.82	11.61	0.21

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.PZM-1/MW-4



RISING HEAD SLUG TEST - PZM-1 / MW-4

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\PZM-1.aqt
Date: 09/29/15 Time: 11:49:11

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Moncure Mine
Test Well: PZM-1 / MW-4
Test Date: 9/18/2014

AQUIFER DATA

Saturated Thickness: 14.04 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.19 ft
Total Well Penetration Depth: 22.7 ft
Casing Radius: 0.083 ft
Static Water Column Height: 14.04 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001413 cm/sec
y0 = 1.117 ft

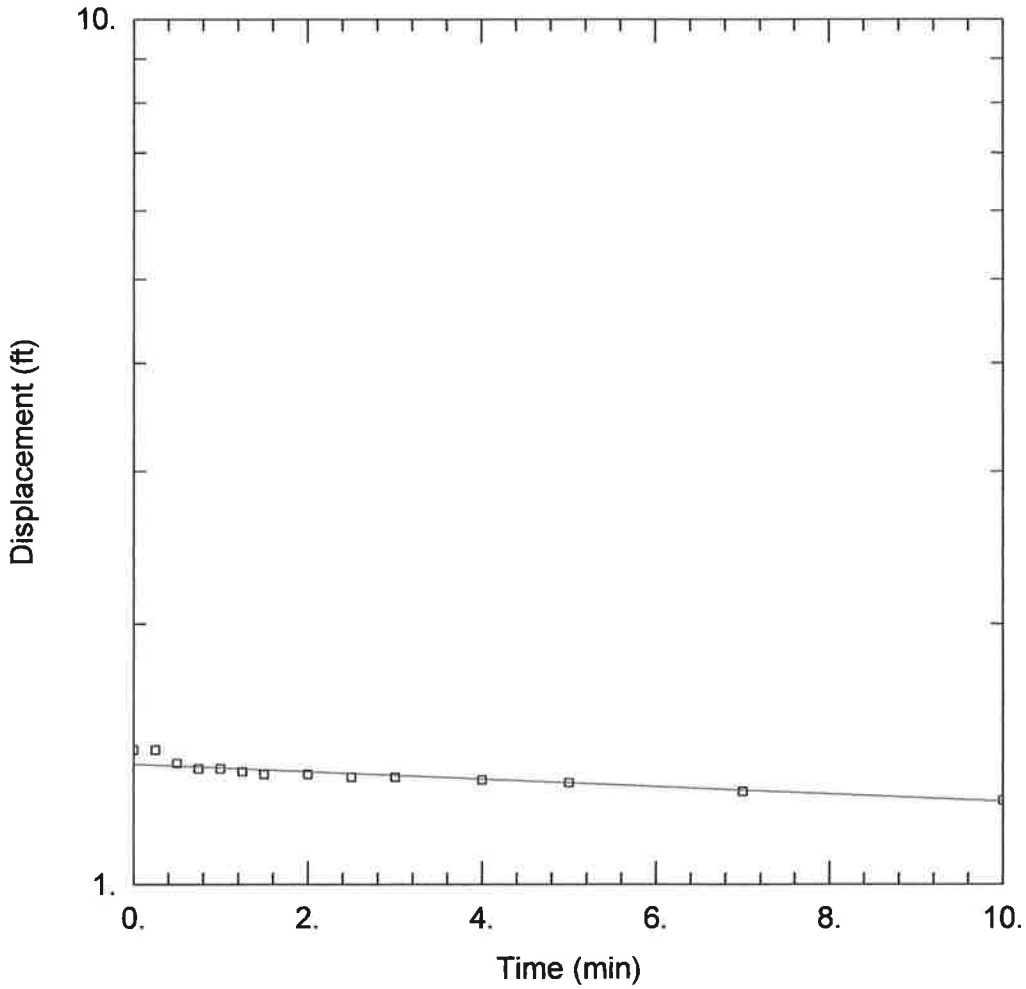
PZM-22 / MW-5
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 1.43'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 44.40'
Total Depth Well Below Top-of-Casing (BTOC): 46.54'
Static Depth-to-Water BTOC: 14.17'
Static Height of Water in Well: 32.37'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	14.17		
0.25	15.60	14.17	1.43
0.50	15.55	14.17	1.38
0.75	15.53	14.17	1.36
1.00	15.53	14.17	1.36
1.25	15.52	14.17	1.35
1.50	15.51	14.17	1.34
2.00	15.51	14.17	1.34
2.50	15.50	14.17	1.33
3.00	15.50	14.17	1.33
4.00	15.49	14.17	1.32
5.00	15.48	14.17	1.31
7.00	15.45	14.17	1.28
10.00	15.42	14.17	1.25

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-5



RISING HEAD SLUG TEST - PZM-22 / MW-5

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-5.aqt
Date: 09/28/15 Time: 16:23:54

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-5
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 32.37 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 1.43 ft
Total Well Penetration Depth: 44.4 ft
Casing Radius: 0.083 ft
Static Water Column Height: 32.37 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 8.01E-6 cm/sec
y0 = 1.376 ft

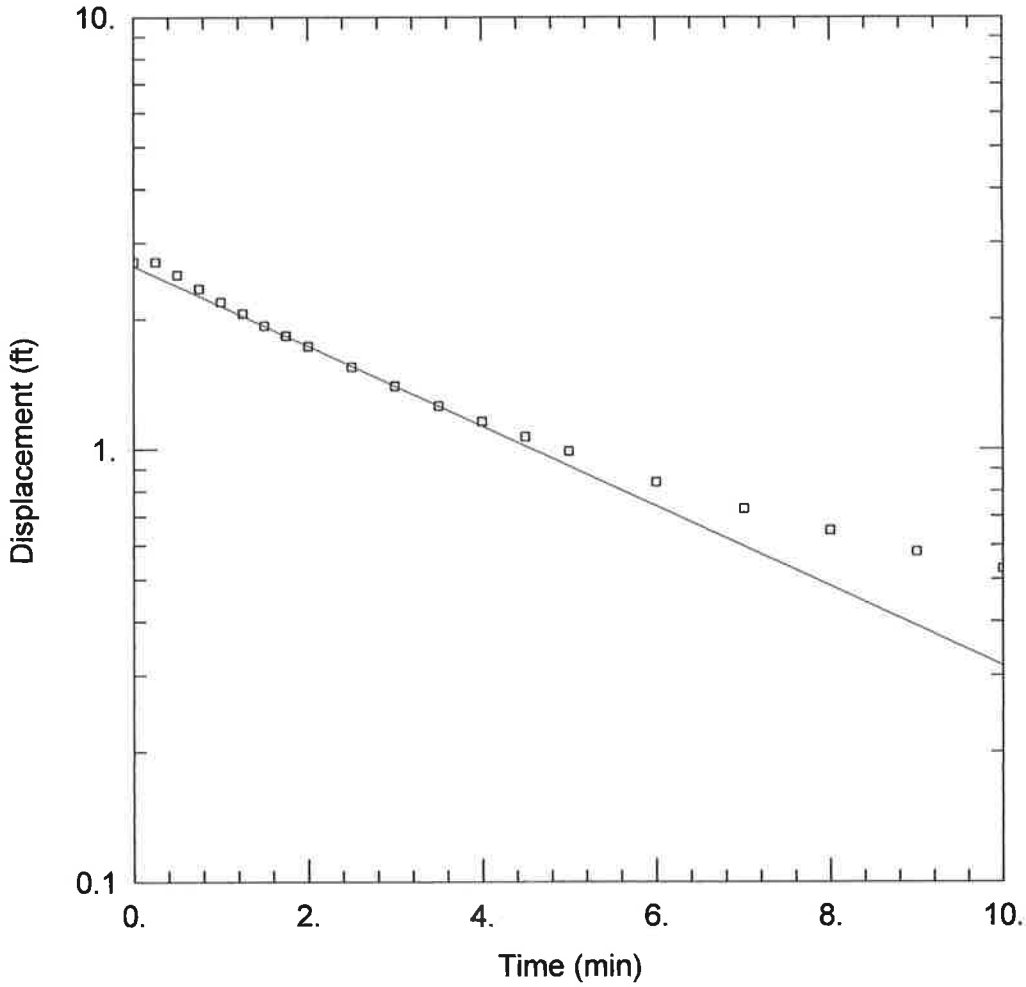
MW-6
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 2.71'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 27.00'
Total Depth Well Below Top-of-Casing (BTOC): 29.47'
Static Depth-to-Water BTOC: 8.25'
Static Height of Water in Well: 21.22'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	8.25		
0.25	10.96	8.25	2.71
0.50	10.78	8.25	2.53
0.75	10.60	8.25	2.35
1.00	10.44	8.25	2.19
1.25	10.31	8.25	2.06
1.50	10.18	8.25	1.93
1.75	10.08	8.25	1.83
2.00	9.98	8.25	1.73
2.50	9.80	8.25	1.55
3.00	9.65	8.25	1.40
3.50	9.51	8.25	1.26
4.00	9.41	8.25	1.16
4.50	9.32	8.25	1.07
5.00	9.24	8.25	0.99
6.00	9.09	8.25	0.84
7.00	8.98	8.25	0.73
8.00	8.90	8.25	0.65
9.00	8.83	8.25	0.58
10.00	8.78	8.25	0.53

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (2) bailers of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-6



RISING HEAD SLUG TEST - MW-6

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-6.aqt
Date: 09/28/15 Time: 16:31:56

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-6
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 21.22 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 2.71 ft
Total Well Penetration Depth: 27. ft
Casing Radius: 0.083 ft
Static Water Column Height: 21.22 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001097 cm/sec
y0 = 2.65 ft

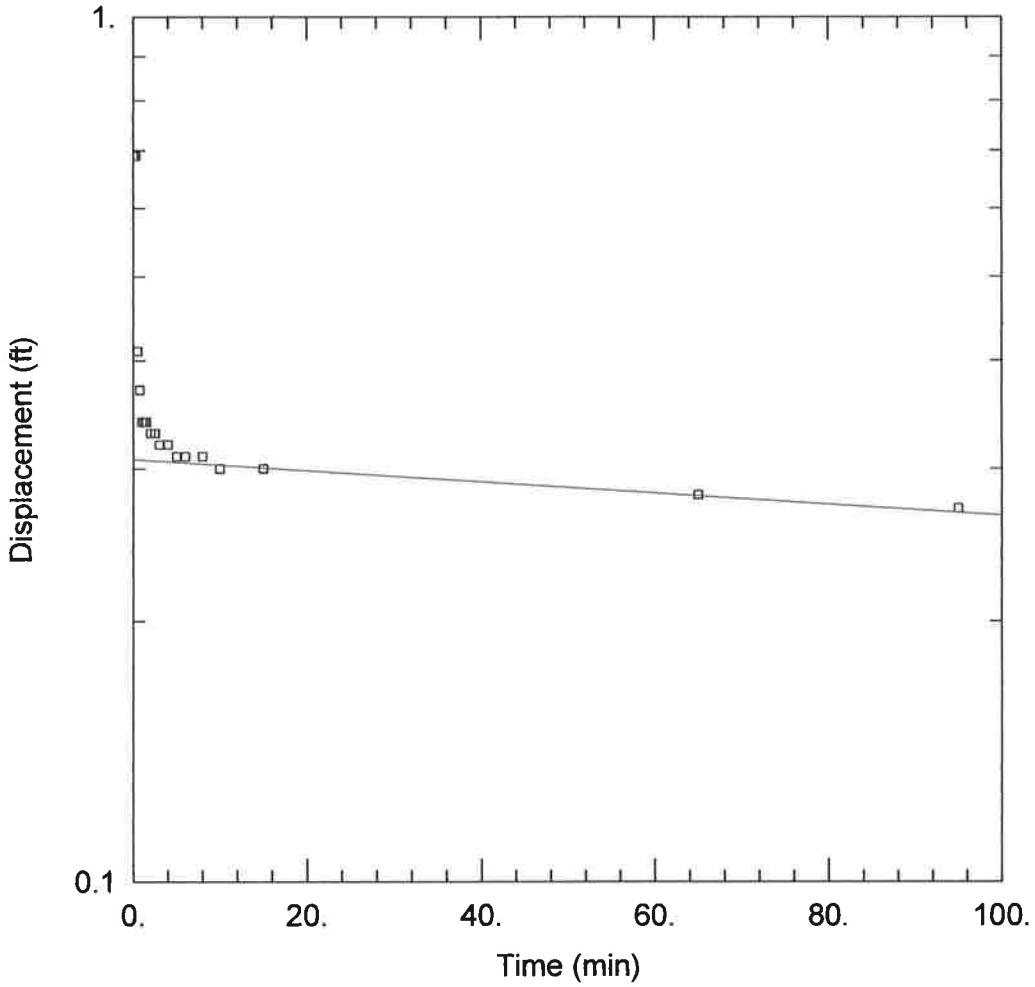
MW-7
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.69'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 15.00'
Total Depth Well Below Top-of-Casing (BTOC): 17.18'
Static Depth-to-Water BTOC: 9.11'
Static Height of Water in Well: 8.07'
Screen Length: 10'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	9.11		
0.25	9.80	9.11	0.69
0.50	9.52	9.11	0.41
0.75	9.48	9.11	0.37
1.00	9.45	9.11	0.34
1.25	9.45	9.11	0.34
1.50	9.45	9.11	0.34
2.00	9.44	9.11	0.33
2.50	9.44	9.11	0.33
3.00	9.43	9.11	0.32
4.00	9.43	9.11	0.32
5.00	9.42	9.11	0.31
6.00	9.42	9.11	0.31
8.00	9.42	9.11	0.31
10.00	9.41	9.11	0.30
15.00	9.41	9.11	0.30
65.00	9.39	9.11	0.28
95.00	9.38	9.11	0.27

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-7



RISING HEAD SLUG TEST - MW-7

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-7.aqt
Date: 09/28/15 Time: 16:35:56

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-7
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 8.07 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.69 ft
Total Well Penetration Depth: 15. ft
Casing Radius: 0.083 ft
Static Water Column Height: 8.07 ft
Screen Length: 10. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 1.264E-6 cm/sec
y0 = 0.3075 ft

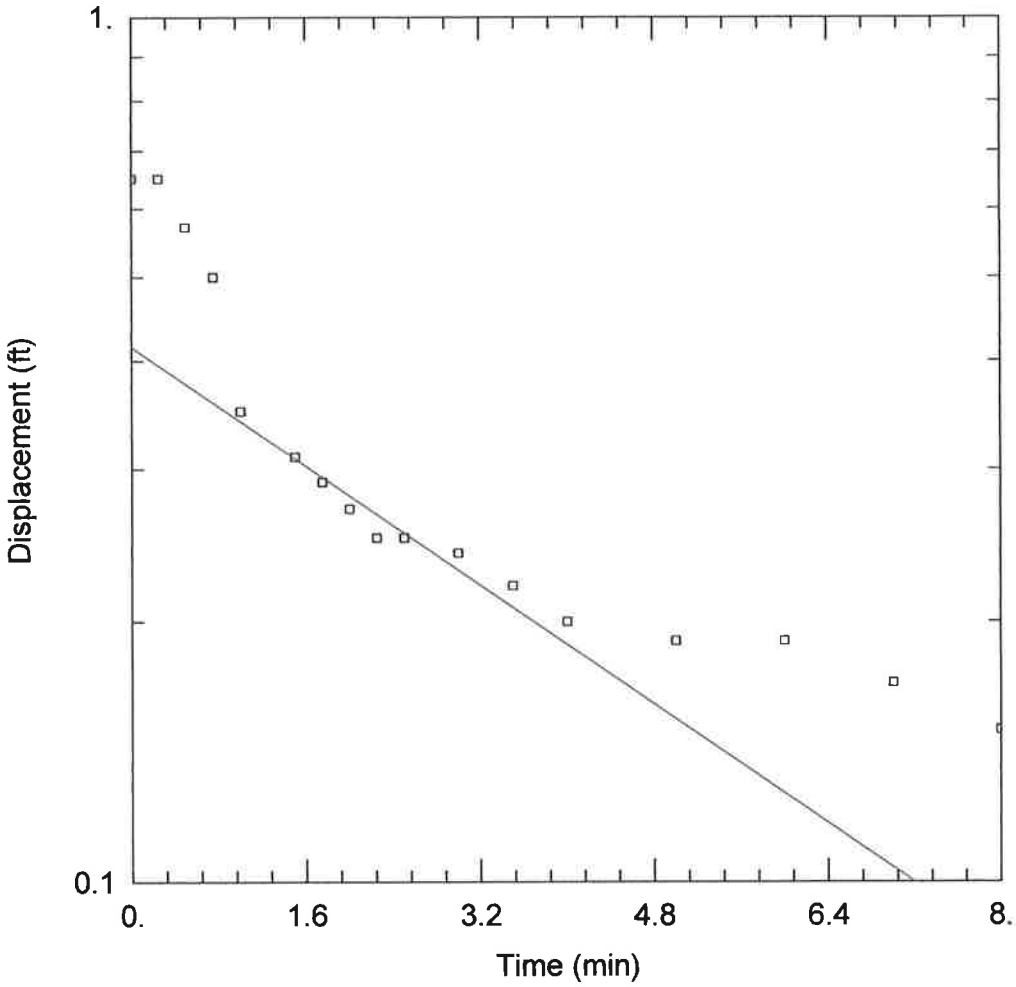
MW-8
RISING HEAD SLUG TEST DATA
BRICKHAVEN NO.2 MINE TRACT "A"
1271 MONCURE-FLATWOOD ROAD
MONCURE, NORTH CAROLINA

Date: September 10, 2015
Initial Drawdown: 0.65'
Radius of Well Casing: 0.083'
Total Depth Well Below Ground Surface: 46.00'
Total Depth Well Below Top-of-Casing (BTOC): 49.06'
Static Depth-to-Water BTOC: 36.40'
Static Height of Water in Well: 12.66'
Screen Length: 15'

Elapsed Time (minutes)	*Depth-to-Water BTOC (feet)*	*Static Depth-to-Water BTOC (feet)*	*Change in Water Level (feet)*
0 (static)	36.40		
0.25	37.05	36.40	0.65
0.50	36.97	36.40	0.57
0.75	36.90	36.40	0.50
1.00	36.75	36.40	0.35
1.50	36.71	36.40	0.31
1.75	36.69	36.40	0.29
2.00	36.67	36.40	0.27
2.25	36.65	36.40	0.25
2.50	36.65	36.40	0.25
3.00	36.64	36.40	0.24
3.50	36.62	36.40	0.22
4.00	36.60	36.40	0.20
5.00	36.59	36.40	0.19
6.00	36.59	36.40	0.19
7.00	36.57	36.40	0.17
8.00	36.55	36.40	0.15

Rising head slug test conducted by Buxton Environmental, Inc. on September 10, 2015 by removing (1) bailer of water and measuring water levels with a depth-to-water electrode to the nearest 0.01 over time

rk:table:BrickhavenSlug.MW-8



RISING HEAD SLUG TEST - MW-8

Data Set: C:\Program Files\HydroSOLVE\AQTESOLV Demo 4.0\BrickMW-8.aqt
Date: 09/28/15 Time: 16:39:34

PROJECT INFORMATION

Company: Buxton Environmental, Inc.
Client: HDR
Project: 1
Location: Brickhaven No.2 Mine
Test Well: MW-8
Test Date: 9/10/2015

AQUIFER DATA

Saturated Thickness: 12.66 ft
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.65 ft
Total Well Penetration Depth: 46. ft
Casing Radius: 0.083 ft
Static Water Column Height: 12.66 ft
Screen Length: 15. ft
Well Radius: 0.083 ft
Gravel Pack Porosity: 0.25

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.0001289 cm/sec
y0 = 0.4152 ft

E

Appendix E – 2nd Round Laboratory Reports, Field Data Sheets, and Chains of Custody (October 2015)

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 09, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on October 15, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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CERTIFICATIONS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92272150001	**MW-1**	Water	10/15/15 12:55	10/15/15 21:00
92272150002	**MW-2**	Water	10/15/15 14:20	10/15/15 21:00
92272150003	**MW-3**	Water	10/15/15 17:00	10/15/15 21:00
92272150004	**TRIP BLANK**	Water	10/15/15 06:00	10/15/15 21:00
92272150005	**FIELD BLANK**	Water	10/15/15 17:45	10/15/15 21:00
92272150006	**EQUIPMENT BLANK**	Water	10/15/15 17:50	10/15/15 21:00

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SAMPLE ANALYTE COUNT

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92272150001	**MW-1**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272150002	**MW-2**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272150003	**MW-3**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272150004	**TRIP BLANK**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272150005	**FIELD BLANK**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272150006	**EQUIPMENT BLANK**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272150001	**MW-1**					
EPA 300.0	Chloride	72.0	mg/L	1.0	10/21/15 13:42	
EPA 300.0	Fluoride	0.16	mg/L	0.10	10/21/15 13:42	
EPA 300.0	Sulfate	13.1	mg/L	1.0	10/21/15 13:42	
EPA 6010	Barium	117	ug/L	5.0	10/20/15 20:27	
EPA 6010	Calcium	36500	ug/L	100	10/20/15 20:27	
EPA 6010	Zinc	12.4	ug/L	10.0	10/20/15 20:27	
EPA 6020A	Boron	14.6	ug/L	5.0	10/27/15 13:59	
EPA 6020A	Lithium	20.9	ug/L	0.50	10/27/15 13:59	
EPA 903.1	Radium-226	0.387 ± 0.290 (0.150) C:NA T:96%	pCi/L		11/04/15 12:30	
EPA 904.0	Radium-228	0.0801 ± 0.329 (0.747) C:78% T:87%	pCi/L		11/04/15 11:55	
Total Radium Calculation	Total Radium	0.467 ± 0.619 (0.897)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	370	mg/L	25.0	10/19/15 08:44	
92272150002	**MW-2**					
EPA 300.0	Chloride	972	mg/L	10.0	10/21/15 21:10	
EPA 300.0	Fluoride	0.34	mg/L	0.10	10/21/15 14:05	
EPA 300.0	Sulfate	199	mg/L	10.0	10/21/15 21:10	
EPA 6010	Antimony	9.4	ug/L	5.0	10/20/15 20:39	
EPA 6010	Barium	372	ug/L	5.0	10/20/15 20:39	
EPA 6010	Calcium	153000	ug/L	1000	10/21/15 14:14	
EPA 6010	Chromium	13.0	ug/L	5.0	10/20/15 20:39	
EPA 6010	Molybdenum	20.6	ug/L	5.0	10/20/15 20:39	
EPA 6010	Nickel	7.8	ug/L	5.0	10/20/15 20:39	
EPA 6010	Zinc	26.8	ug/L	10.0	10/20/15 20:39	
EPA 6020A	Boron	25.7	ug/L	5.0	10/27/15 14:01	
EPA 6020A	Lithium	34.0	ug/L	0.50	10/27/15 14:01	
EPA 8260	Chloroform	1.8	ug/L	1.0	10/18/15 06:21	
EPA 903.1	Radium-226	0.681 ± 0.690 (0.974) C:NA T:95%	pCi/L		11/06/15 10:21	
EPA 904.0	Radium-228	1.56 ± 0.505 (0.647) C:78% T:83%	pCi/L		11/04/15 11:55	
Total Radium Calculation	Total Radium	2.24 ± 1.20 (1.62)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	2120	mg/L	250	10/19/15 08:45	
92272150003	**MW-3**					
EPA 300.0	Chloride	1160	mg/L	25.0	10/21/15 21:39	
EPA 300.0	Fluoride	0.22	mg/L	0.10	10/21/15 14:27	

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272150003	**MW-3**					
EPA 300.0	Sulfate	14.0	mg/L	1.0	10/21/15 14:27	
EPA 6010	Antimony	12.0	ug/L	5.0	10/20/15 20:42	
EPA 6010	Barium	860	ug/L	5.0	10/20/15 20:42	
EPA 6010	Calcium	185000	ug/L	1000	10/21/15 14:17	
EPA 6010	Molybdenum	10.5	ug/L	5.0	10/20/15 20:42	
EPA 6010	Zinc	41.8	ug/L	10.0	10/20/15 20:42	
EPA 6020A	Boron	38.0	ug/L	5.0	10/27/15 20:41	
EPA 6020A	Lithium	70.4	ug/L	0.50	10/27/15 20:41	
EPA 903.1	Radium-226	1.59 ± 0.820 (0.946) C:NA T:95%	pCi/L		11/06/15 10:41	
EPA 904.0	Radium-228	1.34 ± 0.462 (0.636) C:80% T:87%	pCi/L		11/04/15 11:55	
Total Radium Calculation	Total Radium	2.93 ± 1.28 (1.58)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	2770	mg/L	250	10/19/15 08:46	
92272150004	**TRIP BLANK**					
EPA 903.1	Radium-226	0.482 ± 0.390 (0.218) C:NA T:100%	pCi/L		11/06/15 10:21	
EPA 904.0	Radium-228	0.0525 ± 0.312 (0.713) C:79% T:85%	pCi/L		11/04/15 11:55	
Total Radium Calculation	Total Radium	0.535 ± 0.702 (0.931)	pCi/L		11/09/15 11:40	
92272150005	**FIELD BLANK**					
EPA 8260	Methylene Chloride	3.2	ug/L	1.0	10/18/15 07:14	
EPA 903.1	Radium-226	0.0909 ± 0.472 (0.979) C:NA T:94%	pCi/L		11/06/15 10:42	
EPA 904.0	Radium-228	-0.0397 ± 0.288 (0.684) C:77% T:84%	pCi/L		11/04/15 11:55	
Total Radium Calculation	Total Radium	0.0512 ± 0.760 (1.66)	pCi/L		11/09/15 11:40	
92272150006	**EQUIPMENT BLANK**					
EPA 8260	Methylene Chloride	2.8	ug/L	1.0	10/18/15 07:31	

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272150006	**EQUIPMENT BLANK**					
EPA 903.1	Radium-226	0.0124 ± 0.519 (0.975) C:NA T:98%	pCi/L		11/06/15 10:58	
EPA 904.0	Radium-228	0.435 ± 0.358 (0.714) C:77% T:83%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	0.447 ± 0.877 (1.69)	pCi/L		11/09/15 11:40	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-1 **Lab ID: 92272150001** Collected: 10/15/15 12:55 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**72.0**	mg/L	1.0	1		10/21/15 13:42	16887-00-6	
Fluoride	**0.16**	mg/L	0.10	1		10/21/15 13:42	16984-48-8	
Sulfate	**13.1**	mg/L	1.0	1		10/21/15 13:42	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:27	7440-38-2	
Barium	**117**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:27	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:27	7440-43-9	
Calcium	**36500**	ug/L	100	1	10/19/15 19:30	10/20/15 20:27	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:27	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:27	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:27	7440-62-2	
Zinc	**12.4**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:27	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**14.6**	ug/L	5.0	1	10/27/15 10:30	10/27/15 13:59	7440-42-8	
Lithium	**20.9**	ug/L	0.50	1	10/27/15 10:30	10/27/15 13:59	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:25	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 06:03	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 06:03	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 06:03	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 06:03	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 06:03	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 06:03	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 06:03	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 06:03	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 06:03	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 06:03	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 06:03	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 06:03	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 06:03	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 06:03	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 06:03	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-1 **Lab ID: 92272150001** Collected: 10/15/15 12:55 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 06:03	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:03	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:03	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 06:03	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:03	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:03	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:03	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 06:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:03	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 06:03	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 06:03	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 06:03	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 06:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 06:03	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 06:03	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:03	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:03	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 06:03	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 06:03	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:03	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 06:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 06:03	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 06:03	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 06:03	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 06:03	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 06:03	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		10/18/15 06:03	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/18/15 06:03	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/18/15 06:03	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**370**	mg/L	25.0	1		10/19/15 08:44		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-2 **Lab ID: 92272150002** Collected: 10/15/15 14:20 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**972**	mg/L	10.0	10		10/21/15 21:10	16887-00-6	
Fluoride	**0.34**	mg/L	0.10	1		10/21/15 14:05	16984-48-8	
Sulfate	**199**	mg/L	10.0	10		10/21/15 21:10	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	**9.4**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:39	7440-38-2	
Barium	**372**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:39	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:39	7440-43-9	
Calcium	**153000**	ug/L	1000	10	10/19/15 19:30	10/21/15 14:14	7440-70-2	
Chromium	**13.0**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7439-92-1	
Molybdenum	**20.6**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7439-98-7	
Nickel	**7.8**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:39	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:39	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:39	7440-62-2	
Zinc	**26.8**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:39	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**25.7**	ug/L	5.0	1	10/27/15 10:30	10/27/15 14:01	7440-42-8	
Lithium	**34.0**	ug/L	0.50	1	10/27/15 10:30	10/27/15 14:01	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:32	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 06:21	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 06:21	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 06:21	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 06:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 06:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 06:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 06:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 06:21	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 06:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 06:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 06:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 06:21	75-00-3	
Chloroform	**1.8**	ug/L	1.0	1		10/18/15 06:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 06:21	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 06:21	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-2 **Lab ID: 92272150002** Collected: 10/15/15 14:20 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 06:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 06:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 06:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 06:21	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 06:21	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 06:21	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 06:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 06:21	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 06:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 06:21	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 06:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 06:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 06:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 06:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 06:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 06:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 06:21	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		10/18/15 06:21	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		10/18/15 06:21	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/18/15 06:21	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2120**	mg/L	250	1		10/19/15 08:45		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-3 **Lab ID: 92272150003** Collected: 10/15/15 17:00 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1160**	mg/L	25.0	25		10/21/15 21:39	16887-00-6	
Fluoride	**0.22**	mg/L	0.10	1		10/21/15 14:27	16984-48-8	
Sulfate	**14.0**	mg/L	1.0	1		10/21/15 14:27	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	**12.0**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:42	7440-38-2	
Barium	**860**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:42	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:42	7440-43-9	
Calcium	**185000**	ug/L	1000	10	10/19/15 19:30	10/21/15 14:17	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7439-92-1	
Molybdenum	**10.5**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:42	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:42	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:42	7440-62-2	
Zinc	**41.8**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:42	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**38.0**	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:41	7440-42-8	
Lithium	**70.4**	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:41	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:34	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 06:38	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 06:38	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 06:38	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 06:38	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 06:38	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 06:38	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 06:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 06:38	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 06:38	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 06:38	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 06:38	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 06:38	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 06:38	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 06:38	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 06:38	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-3 **Lab ID: 92272150003** Collected: 10/15/15 17:00 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 06:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:38	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:38	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 06:38	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 06:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:38	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 06:38	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 06:38	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 06:38	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 06:38	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 06:38	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 06:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:38	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 06:38	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 06:38	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:38	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 06:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 06:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 06:38	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 06:38	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 06:38	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 06:38	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		10/18/15 06:38	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/18/15 06:38	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/18/15 06:38	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2770**	mg/L	250	1		10/19/15 08:46		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: TRIP BLANK **Lab ID: 92272150004** Collected: 10/15/15 06:00 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		10/21/15 14:51	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/21/15 14:51	16984-48-8	
Sulfate	ND	mg/L	1.0	1		10/21/15 14:51	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:45	7440-38-2	
Barium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:45	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:45	7440-43-9	
Calcium	ND	ug/L	100	1	10/19/15 19:30	10/20/15 20:45	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:45	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:45	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:45	7440-62-2	
Zinc	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:45	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:43	7440-42-8	
Lithium	ND	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:43	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:36	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 06:56	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 06:56	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 06:56	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 06:56	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 06:56	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 06:56	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 06:56	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 06:56	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 06:56	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 06:56	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 06:56	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 06:56	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 06:56	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 06:56	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 06:56	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: TRIP BLANK **Lab ID: 92272150004** Collected: 10/15/15 06:00 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 06:56	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:56	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 06:56	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 06:56	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:56	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 06:56	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:56	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:56	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 06:56	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 06:56	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:56	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 06:56	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 06:56	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 06:56	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 06:56	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 06:56	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 06:56	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 06:56	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:56	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 06:56	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 06:56	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 06:56	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:56	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 06:56	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 06:56	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 06:56	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 06:56	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 06:56	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 06:56	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 06:56	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		10/18/15 06:56	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/18/15 06:56	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		10/18/15 06:56	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		10/19/15 08:47		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: FIELD BLANK **Lab ID: 92272150005** Collected: 10/15/15 17:45 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		10/21/15 16:00	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/21/15 16:00	16984-48-8	
Sulfate	ND	mg/L	1.0	1		10/21/15 16:00	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:48	7440-38-2	
Barium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:48	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:48	7440-43-9	
Calcium	ND	ug/L	100	1	10/19/15 19:30	10/20/15 20:48	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:48	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:48	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:48	7440-62-2	
Zinc	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:48	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:46	7440-42-8	
Lithium	ND	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:46	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:39	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 07:14	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 07:14	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 07:14	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 07:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 07:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 07:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 07:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 07:14	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 07:14	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 07:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 07:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 07:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 07:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 07:14	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 07:14	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: FIELD BLANK **Lab ID: 92272150005** Collected: 10/15/15 17:45 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 07:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 07:14	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 07:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 07:14	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 07:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 07:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 07:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 07:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 07:14	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 07:14	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 07:14	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 07:14	74-88-4	
Methylene Chloride	**3.2**	ug/L	1.0	1		10/18/15 07:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 07:14	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 07:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 07:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 07:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 07:14	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 07:14	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 07:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 07:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 07:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 07:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 07:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 07:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 07:14	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 07:14	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	109	%	70-130	1		10/18/15 07:14	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		10/18/15 07:14	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		10/18/15 07:14	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		10/19/15 08:47		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: EQUIPMENT BLANK **Lab ID: 92272150006** Collected: 10/15/15 17:50 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		10/21/15 16:22	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/21/15 16:22	16984-48-8	
Sulfate	ND	mg/L	1.0	1		10/21/15 16:22	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:52	7440-38-2	
Barium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:52	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:52	7440-43-9	
Calcium	ND	ug/L	100	1	10/19/15 19:30	10/20/15 20:52	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:52	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:52	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:52	7440-62-2	
Zinc	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:52	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:49	7440-42-8	
Lithium	ND	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:49	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:41	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 07:31	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 07:31	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 07:31	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 07:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 07:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 07:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 07:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 07:31	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 07:31	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 07:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 07:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 07:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 07:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 07:31	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 07:31	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: EQUIPMENT BLANK **Lab ID: 92272150006** Collected: 10/15/15 17:50 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 07:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 07:31	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 07:31	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 07:31	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 07:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 07:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 07:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 07:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 07:31	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 07:31	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 07:31	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 07:31	74-88-4	
Methylene Chloride	**2.8**	ug/L	1.0	1		10/18/15 07:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 07:31	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 07:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 07:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 07:31	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 07:31	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 07:31	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 07:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 07:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 07:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 07:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 07:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 07:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 07:31	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 07:31	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		10/18/15 07:31	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/18/15 07:31	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/18/15 07:31	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		10/19/15 08:48		

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: GWD/2594 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 1587393 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/21/15 10:39	
Fluoride	mg/L	ND	0.10	10/21/15 10:39	
Sulfate	mg/L	ND	1.0	10/21/15 10:39	

LABORATORY CONTROL SAMPLE: 1587394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.1	98	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	50	47.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587395 1587396

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	10.2	50	50	59.9	60.1	99	100	90-110	0	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	93	95	90-110	2	20	
Sulfate	mg/L	28.1	50	50	77.1	77.3	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587397 1587398

Parameter	Units	92272483001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16.4	50	50	66.1	65.9	99	99	90-110	0	20	
Fluoride	mg/L	0.67	2.5	2.5	3.1	3.1	99	98	90-110	1	20	
Sulfate	mg/L	24.2	50	50	73.0	72.7	98	97	90-110	0	20	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: MERP/8557 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 1586006 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/20/15 13:03	

LABORATORY CONTROL SAMPLE: 1586007

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586008 1586009

Parameter	Units	92271942001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	92	92	75-125	0	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: MPRP/19840 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 1585679 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	10/20/15 20:03	
Arsenic	ug/L	ND	10.0	10/20/15 20:03	
Barium	ug/L	ND	5.0	10/20/15 20:03	
Beryllium	ug/L	ND	1.0	10/20/15 20:03	
Cadmium	ug/L	ND	1.0	10/20/15 20:03	
Calcium	ug/L	ND	100	10/20/15 20:03	
Chromium	ug/L	ND	5.0	10/20/15 20:03	
Cobalt	ug/L	ND	5.0	10/20/15 20:03	
Copper	ug/L	ND	5.0	10/20/15 20:03	
Lead	ug/L	ND	5.0	10/20/15 20:03	
Molybdenum	ug/L	ND	5.0	10/20/15 20:03	
Nickel	ug/L	ND	5.0	10/20/15 20:03	
Selenium	ug/L	ND	10.0	10/20/15 20:03	
Silver	ug/L	ND	5.0	10/20/15 20:03	
Thallium	ug/L	ND	5.4	10/20/15 20:03	
Vanadium	ug/L	ND	5.0	10/20/15 20:03	
Zinc	ug/L	ND	10.0	10/20/15 20:03	

LABORATORY CONTROL SAMPLE: 1585680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	511	102	80-120	
Arsenic	ug/L	500	488	98	80-120	
Barium	ug/L	500	514	103	80-120	
Beryllium	ug/L	500	510	102	80-120	
Cadmium	ug/L	500	509	102	80-120	
Calcium	ug/L	5000	4960	99	80-120	
Chromium	ug/L	500	507	101	80-120	
Cobalt	ug/L	500	501	100	80-120	
Copper	ug/L	500	516	103	80-120	
Lead	ug/L	500	495	99	80-120	
Molybdenum	ug/L	500	536	107	80-120	
Nickel	ug/L	500	505	101	80-120	
Selenium	ug/L	500	495	99	80-120	
Silver	ug/L	250	249	100	80-120	
Thallium	ug/L	500	491	98	80-120	
Vanadium	ug/L	500	495	99	80-120	
Zinc	ug/L	500	485	97	80-120	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1585681 1585682

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	480	474	96	94	75-125	1	25	
Arsenic	ug/L	ND	500	500	478	470	95	93	75-125	2	25	
Barium	ug/L	70.7	500	500	551	535	96	93	75-125	3	25	
Beryllium	ug/L	ND	500	500	468	457	94	91	75-125	2	25	
Cadmium	ug/L	ND	500	500	477	471	95	94	75-125	1	25	
Calcium	ug/L	10000	5000	5000	15900	15400	117	108	75-125	3	25	
Chromium	ug/L	ND	500	500	474	465	94	93	75-125	2	25	
Cobalt	ug/L	5.2	500	500	485	478	96	95	75-125	1	25	
Copper	ug/L	6.7	500	500	495	487	98	96	75-125	2	25	
Lead	ug/L	ND	500	500	474	468	94	93	75-125	1	25	
Molybdenum	ug/L	ND	500	500	508	501	101	100	75-125	1	25	
Nickel	ug/L	ND	500	500	476	467	94	93	75-125	2	25	
Selenium	ug/L	ND	500	500	468	460	94	92	75-125	2	25	
Silver	ug/L	ND	250	250	235	231	94	92	75-125	2	25	
Thallium	ug/L	ND	500	500	457	453	91	90	75-125	1	25	
Vanadium	ug/L	6.9	500	500	483	473	95	93	75-125	2	25	
Zinc	ug/L	18.8	500	500	512	505	99	97	75-125	1	25	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: MPRP/59095 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 2118485 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	10/27/15 13:46	
Lithium	ug/L	ND	0.50	10/27/15 13:46	

LABORATORY CONTROL SAMPLE: 2118486

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	80.2	100	80-120	
Lithium	ug/L	80	85.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2118487 2118488

Parameter	Units	92272367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	53.1	80	80	161	158	135	132	75-125	2	20	M1
Lithium	ug/L	23.5	80	80	110	107	108	105	75-125	3	20	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: MSV/33856 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 1585329 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1-Dichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
1,2,3-Trichloropropane	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichloropropane	ug/L	ND	1.0	10/18/15 04:17	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
2-Butanone (MEK)	ug/L	ND	5.0	10/18/15 04:17	
2-Hexanone	ug/L	ND	5.0	10/18/15 04:17	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/18/15 04:17	
Acetone	ug/L	ND	25.0	10/18/15 04:17	
Acrylonitrile	ug/L	ND	10.0	10/18/15 04:17	
Benzene	ug/L	ND	1.0	10/18/15 04:17	
Bromochloromethane	ug/L	ND	1.0	10/18/15 04:17	
Bromodichloromethane	ug/L	ND	1.0	10/18/15 04:17	
Bromoform	ug/L	ND	1.0	10/18/15 04:17	
Bromomethane	ug/L	ND	2.0	10/18/15 04:17	
Carbon disulfide	ug/L	ND	2.0	10/18/15 04:17	
Carbon tetrachloride	ug/L	ND	1.0	10/18/15 04:17	
Chlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
Chloroethane	ug/L	ND	1.0	10/18/15 04:17	
Chloroform	ug/L	ND	1.0	10/18/15 04:17	
Chloromethane	ug/L	ND	1.0	10/18/15 04:17	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/18/15 04:17	
Dibromochloromethane	ug/L	ND	1.0	10/18/15 04:17	
Dibromomethane	ug/L	ND	1.0	10/18/15 04:17	
Ethylbenzene	ug/L	ND	1.0	10/18/15 04:17	
Iodomethane	ug/L	ND	5.0	10/18/15 04:17	
Methylene Chloride	ug/L	ND	1.0	10/18/15 04:17	
Styrene	ug/L	ND	1.0	10/18/15 04:17	
Tetrachloroethene	ug/L	ND	1.0	10/18/15 04:17	
Toluene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	10/18/15 04:17	
Trichloroethene	ug/L	ND	1.0	10/18/15 04:17	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

METHOD BLANK: 1585329 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	10/18/15 04:17	
Vinyl acetate	ug/L	ND	2.0	10/18/15 04:17	
Vinyl chloride	ug/L	ND	1.0	10/18/15 04:17	
Xylene (Total)	ug/L	ND	2.0	10/18/15 04:17	
1,2-Dichloroethane-d4 (S)	%	104	70-130	10/18/15 04:17	
4-Bromofluorobenzene (S)	%	106	70-130	10/18/15 04:17	
Toluene-d8 (S)	%	100	70-130	10/18/15 04:17	

LABORATORY CONTROL SAMPLE: 1585330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.1	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.7	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	53.3	107	79-124	
1,1,2-Trichloroethane	ug/L	50	48.3	97	85-125	
1,1-Dichloroethane	ug/L	50	50.7	101	73-126	
1,1-Dichloroethene	ug/L	50	54.2	108	66-135	
1,2,3-Trichloropropane	ug/L	50	53.4	107	75-130	
1,2-Dichlorobenzene	ug/L	50	49.1	98	80-133	
1,2-Dichloroethane	ug/L	50	46.5	93	67-128	
1,2-Dichloropropane	ug/L	50	50.2	100	75-132	
1,4-Dichlorobenzene	ug/L	50	49.0	98	78-130	
2-Butanone (MEK)	ug/L	100	108	108	61-144	
2-Hexanone	ug/L	100	116	116	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	112	112	72-135	
Acetone	ug/L	100	112	112	48-146	
Acrylonitrile	ug/L	250	274	109	40-160	
Benzene	ug/L	50	51.2	102	80-125	
Bromochloromethane	ug/L	50	49.1	98	71-125	
Bromodichloromethane	ug/L	50	48.5	97	78-124	
Bromoform	ug/L	50	45.5	91	71-128	
Bromomethane	ug/L	50	43.0	86	40-160	
Carbon disulfide	ug/L	50	54.6	109	50-160	
Carbon tetrachloride	ug/L	50	48.7	97	69-131	
Chlorobenzene	ug/L	50	49.3	99	81-122	
Chloroethane	ug/L	50	40.5	81	39-148	
Chloroform	ug/L	50	47.4	95	73-127	
Chloromethane	ug/L	50	51.4	103	44-146	
cis-1,2-Dichloroethene	ug/L	50	48.6	97	74-124	
cis-1,3-Dichloropropene	ug/L	50	48.8	98	72-132	
Dibromochloromethane	ug/L	50	48.4	97	78-125	
Dibromomethane	ug/L	50	49.7	99	82-120	
Ethylbenzene	ug/L	50	49.9	100	79-121	
Iodomethane	ug/L	100	110	110	39-154	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

LABORATORY CONTROL SAMPLE: 1585330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.8	100	64-133	
Styrene	ug/L	50	51.7	103	84-126	
Tetrachloroethene	ug/L	50	47.3	95	78-122	
Toluene	ug/L	50	49.3	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	50.8	102	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.7	97	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	40.3	81	40-160	
Trichloroethene	ug/L	50	49.4	99	78-122	
Trichlorofluoromethane	ug/L	50	47.9	96	53-137	
Vinyl acetate	ug/L	100	104	104	40-160	
Vinyl chloride	ug/L	50	54.3	109	58-137	
Xylene (Total)	ug/L	150	151	100	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1585331

Parameter	Units	92272154003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.0	105	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.5	107	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.5	103	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,1-Dichloroethene	ug/L	ND	20	29.4	147	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.9	110	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.8	99	70-130	
1,2-Dichloroethane	ug/L	ND	20	20.5	103	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.8	109	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.2	113	70-130	
2-Hexanone	ug/L	ND	40	47.6	119	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	47.5	119	70-130	
Acetone	ug/L	ND	40	53.1	133	70-130	M1
Acrylonitrile	ug/L	ND	100	118	118	70-130	
Benzene	ug/L	ND	20	21.9	110	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.2	101	70-130	
Bromoform	ug/L	ND	20	17.2	86	70-130	
Bromomethane	ug/L	ND	20	21.5	107	70-130	
Carbon disulfide	ug/L	ND	20	29.2	146	70-130	M1
Carbon tetrachloride	ug/L	ND	20	21.7	109	70-130	
Chlorobenzene	ug/L	ND	20	21.8	109	70-146	
Chloroethane	ug/L	ND	20	33.8	169	70-130	M1
Chloroform	ug/L	ND	20	20.6	103	70-130	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

MATRIX SPIKE SAMPLE: 1585331

Parameter	Units	92272154003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	25.3	126	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.9	104	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	18.9	94	70-130	
Dibromochloromethane	ug/L	ND	20	18.9	94	70-130	
Dibromomethane	ug/L	ND	20	22.5	113	70-130	
Ethylbenzene	ug/L	ND	20	21.2	106	70-130	
Iodomethane	ug/L	ND	40	41.5	104	70-130	
Methylene Chloride	ug/L	ND	20	24.0	120	70-130	
Styrene	ug/L	ND	20	21.4	107	70-130	
Tetrachloroethene	ug/L	ND	20	21.1	106	70-130	
Toluene	ug/L	ND	20	21.3	107	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.2	106	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.9	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.5	83	70-130	
Trichloroethene	ug/L	ND	20	22.1	110	69-151	
Trichlorofluoromethane	ug/L	ND	20	29.4	147	70-130	M1
Vinyl acetate	ug/L	ND	40	32.4	81	70-130	
Vinyl chloride	ug/L	ND	20	26.9	134	70-130	M1
1,2-Dichloroethane-d4 (S)	%				102	70-130	
4-Bromofluorobenzene (S)	%				112	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1585332

Parameter	Units	92272154004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

SAMPLE DUPLICATE: 1585332

Parameter	Units	92272154004 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	103	101	2		
4-Bromofluorobenzene (S)	%	105	106	2		
Toluene-d8 (S)	%	101	99	2		

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: WET/40905 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 1585450 Matrix: Water
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	10/19/15 08:38	

LABORATORY CONTROL SAMPLE: 1585451

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	260	104	90-110	

SAMPLE DUPLICATE: 1585452

Parameter	Units	92271800007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1630	2210	30	5	D6

SAMPLE DUPLICATE: 1585453

Parameter	Units	92272150001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	370	383	3	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-1 **Lab ID: 92272150001** Collected: 10/15/15 12:55 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.387 ± 0.290 (0.150) C:NA T:96%**	pCi/L	11/04/15 12:30	13982-63-3	
Radium-228	EPA 904.0	**0.0801 ± 0.329 (0.747) C:78% T:87%**	pCi/L	11/04/15 11:55	15262-20-1	
Total Radium	Total Radium Calculation	**0.467 ± 0.619 (0.897)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-2 **Lab ID: 92272150002** Collected: 10/15/15 14:20 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.681 ± 0.690 (0.974) C:NA T:95%**	pCi/L	11/06/15 10:21	13982-63-3	
Radium-228	EPA 904.0	**1.56 ± 0.505 (0.647) C:78% T:83%**	pCi/L	11/04/15 11:55	15262-20-1	
Total Radium	Total Radium Calculation	**2.24 ± 1.20 (1.62)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: MW-3 **Lab ID: 92272150003** Collected: 10/15/15 17:00 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.59 ± 0.820 (0.946) C:NA T:95%**	pCi/L	11/06/15 10:41	13982-63-3	
Radium-228	EPA 904.0	**1.34 ± 0.462 (0.636) C:80% T:87%**	pCi/L	11/04/15 11:55	15262-20-1	
Total Radium	Total Radium Calculation	**2.93 ± 1.28 (1.58)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: TRIP BLANK **Lab ID: 92272150004** Collected: 10/15/15 06:00 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.482 ± 0.390 (0.218)** **C:NA T:100%**	pCi/L	11/06/15 10:21	13982-63-3	
Radium-228	EPA 904.0	**0.0525 ± 0.312 (0.713)** **C:79% T:85%**	pCi/L	11/04/15 11:55	15262-20-1	
Total Radium	Total Radium Calculation	**0.535 ± 0.702 (0.931)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: FIELD BLANK **Lab ID: 92272150005** Collected: 10/15/15 17:45 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0909 ± 0.472 (0.979)** **C:NA T:94%**	pCi/L	11/06/15 10:42	13982-63-3	
Radium-228	EPA 904.0	**-0.0397 ± 0.288 (0.684)** **C:77% T:84%**	pCi/L	11/04/15 11:55	15262-20-1	
Total Radium	Total Radium Calculation	**0.0512 ± 0.760 (1.66)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Sample: EQUIPMENT BLANK **Lab ID: 92272150006** Collected: 10/15/15 17:50 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0124 ± 0.519 (0.975)** **C:NA T:98%**	pCi/L	11/06/15 10:58	13982-63-3	
Radium-228	EPA 904.0	**0.435 ± 0.358 (0.714)** **C:77% T:83%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**0.447 ± 0.877 (1.69)**	pCi/L	11/09/15 11:40	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: RADC/26522 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 970745 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0227 ± 0.561 (0.972) C:NA T:92%	pCi/L	11/06/15 10:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: RADC/26588 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92272150001, 92272150002, 92272150003, 92272150004, 92272150005, 92272150006

METHOD BLANK: 973255 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.487 ± 0.362 (0.707) C:82% T:87%	pCi/L	11/04/15 13:00	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

QC Batch: RADC/26521 | Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 | Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92272150001

METHOD BLANK: 970744 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.236 ± 0.285 (0.434) C:NA T:94%	pCi/L	11/04/15 11:04	

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QUALIFIERS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272150001	**MW-1**	EPA 300.0	GWD/2594		
92272150002	**MW-2**	EPA 300.0	GWD/2594		
92272150003	**MW-3**	EPA 300.0	GWD/2594		
92272150004	**TRIP BLANK**	EPA 300.0	GWD/2594		
92272150005	**FIELD BLANK**	EPA 300.0	GWD/2594		
92272150006	**EQUIPMENT BLANK**	EPA 300.0	GWD/2594		
92272150001	**MW-1**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272150002	**MW-2**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272150003	**MW-3**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272150004	**TRIP BLANK**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272150005	**FIELD BLANK**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272150006	**EQUIPMENT BLANK**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272150001	**MW-1**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272150002	**MW-2**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272150003	**MW-3**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272150004	**TRIP BLANK**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272150005	**FIELD BLANK**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272150006	**EQUIPMENT BLANK**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272150001	**MW-1**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272150002	**MW-2**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272150003	**MW-3**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272150004	**TRIP BLANK**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272150005	**FIELD BLANK**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272150006	**EQUIPMENT BLANK**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272150001	**MW-1**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272150002	**MW-2**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272150003	**MW-3**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272150004	**TRIP BLANK**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272150005	**FIELD BLANK**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272150006	**EQUIPMENT BLANK**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272150001	**MW-1**	EPA 8260	MSV/33856		
92272150002	**MW-2**	EPA 8260	MSV/33856		
92272150003	**MW-3**	EPA 8260	MSV/33856		
92272150004	**TRIP BLANK**	EPA 8260	MSV/33856		
92272150005	**FIELD BLANK**	EPA 8260	MSV/33856		
92272150006	**EQUIPMENT BLANK**	EPA 8260	MSV/33856		
92272150001	**MW-1**	EPA 903.1	RADC/26521		
92272150002	**MW-2**	EPA 903.1	RADC/26522		
92272150003	**MW-3**	EPA 903.1	RADC/26522		
92272150004	**TRIP BLANK**	EPA 903.1	RADC/26522		
92272150005	**FIELD BLANK**	EPA 903.1	RADC/26522		
92272150006	**EQUIPMENT BLANK**	EPA 903.1	RADC/26522		
92272150001	**MW-1**	EPA 904.0	RADC/26588		
92272150002	**MW-2**	EPA 904.0	RADC/26588		
92272150003	**MW-3**	EPA 904.0	RADC/26588		

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Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272150

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272150004	**TRIP BLANK**	EPA 904.0	RADC/26588		
92272150005	**FIELD BLANK**	EPA 904.0	RADC/26588		
92272150006	**EQUIPMENT BLANK**	EPA 904.0	RADC/26588		
92272150001	**MW-1**	Total Radium Calculation	RADC/26787		
92272150002	**MW-2**	Total Radium Calculation	RADC/26787		
92272150003	**MW-3**	Total Radium Calculation	RADC/26787		
92272150004	**TRIP BLANK**	Total Radium Calculation	RADC/26787		
92272150005	**FIELD BLANK**	Total Radium Calculation	RADC/26787		
92272150006	**EQUIPMENT BLANK**	Total Radium Calculation	RADC/26787		
92272150001	**MW-1**	SM 2540C	WET/40905		
92272150002	**MW-2**	SM 2540C	WET/40905		
92272150003	**MW-3**	SM 2540C	WET/40905		
92272150004	**TRIP BLANK**	SM 2540C	WET/40905		
92272150005	**FIELD BLANK**	SM 2540C	WET/40905		
92272150006	**EQUIPMENT BLANK**	SM 2540C	WET/40905		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 16, 2016 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1402 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

Temp Correction Factor **T1402** No Correction

Corrected Cooler Temp.: 5.2 °C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: AP 10-15-15

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☐No ☑N/A	6.
Rush Turn Around Time Requested:	☐Yes ☐No ☑N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:	JJ	**Date:**	10/16/15
SRF Review:	JJ	**Date:**	10/16/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92272150

92272150

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2003545

Section A
Required Client Information:

Company: HDR	
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name: Brickhaven-Charah	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location
STATE: NC

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes
MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226	Metals	Chloride/Sulfate	TDS	Fluoride	VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92272150
1	MW-1		G			10/15/15	1255		11	3		5	3					3	2	1	1	1	3			001
2	MW-2		G			10/15/15	1420		11	3		5	3					3	2	1	1	1	3			002
3	MW-3		G			10/15/15	1700		11	3		5	3					3	2	1	1	1	3			003
4	Trip Blank		G			10/15/15	0600		11	3		5	3					3	2	1	1	1	3			004
5	Field Blank		G			10/15/15	1745		11	3		5	3					3	2	1	1	1	3			005
6	Equipment Blank		G			10/15/15	1750		11	3		5	3					3	2	1	1	1	3			006
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] - Pace	10/15/15	2100	[signature]	10-15-15	2100	5.2	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Matt Markofski

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/15/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): MSM DAH

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 75.57 ft Multi Factor*: 0.1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 59.90 ft Casing Volume: 2.55 gallons

Height of Water Column: 15.67 ft Cal. 3 Volumes: 7.65 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: 1049 Finish: 1249 Purge Rate: 100 mL/min

Purging Method: Mega Monsoon Total Volume Purged: 12000 mL ~~gallons~~

Sampling Information

Date Collected: 10/15/15 Time Collected: 1255 am pm

Sampling Equipment Used: Mega Monsoon

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 21.6 Time: 1255 Turbidity (ntu): 46.5 Time: 1255

Sample pH (s.u.): 7.3 Time: 1255 Diss Oxy (mg/L): 0.2 Time: 1255

Specific Cond. (uS): 614 Time: 1255 Res. Cl (mg/L): — Time: —

ReDox (mV): -81.1 Time: 1255 Other: Fe^{2+} = ND Time: 1255

Odor: None Time: 1255 Appearance: Cloudy

General/Weather Observations

75°F, Sunny, Wind 5-10 mph

Sampler Signature/Date: [signature] 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Static H_2O (ft)
1054	7.0	603	-49.9	603.8	1.4	18.7	500	59.93
1059	7.1	597	-57.7	503.7	1.2	19.3	1000	59.93
1104	7.2	598	-62.1	404.5	1.1	19.6	1500	59.93
1109	7.2	613	-66.8	393.7	1.0	19.7	2000	59.92
1114	7.2	642	-73.7	435.5	0.8	19.8	2500	59.92

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Static H_2O (ft)
1124	7.2	628	-78.9	328.6	0.3	19.7	3500	59.95
1134	7.2	612	-81.3	210.9	0.2	20.6	4500	59.92
1144	7.2	609	-82.4	175.4	0.3	20.8	5500	59.95
1154	7.2	607	-82.9	146.1	0.4	20.9	6500	59.95
1204	7.3	606	-82.9	104.4	0.2	21.2	7500	59.95
1214	7.3	604	-82.4	77.2	0.2	21.4	8500	59.95
1224	7.3	606	-82.1	65.7	0.2	21.6	9500	59.95
1234	7.3	608	-81.6	61.8	0.2	21.6	10500	59.95
1244	7.3	611	-81.2	48.3	0.2	21.6	11500	59.95
1249	7.3	613	-81.1	48.3	0.2	21.7	12000	59.95

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): MSM DAH

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW-2 Well Locked: YES NO 2.01

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 48.15 ft Multi Factor*: 0.1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 39.77 ft Casing Volume: 1.37 gallons

Height of Water Column: 8.38 ft Cal. 3 Volumes: 4.11 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: 1330 Finish: 1405 Purge Rate: 100 mL/min

Purging Method: Mega Monsoon Total Volume Purged: 3500 mL ~~gallons~~

Sampling Information

Date Collected: 10/15/15 Time Collected: 1420 am pm

Sampling Equipment Used: Mega Monsoon

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 24.0 Time: 1420 Turbidity (ntu): 36.1 Time: 1420

Sample pH (s.u.): 7.7 Time: 1420 Diss Oxy (mg/L): 3.6 Time: 1420

Specific Cond. (uS): 3786 Time: 1420 Res. Cl (mg/L): — Time: —

ReDox (mV): -25.8 Time: 1420 Other: Fe^{2+} = ND Time: 1420

Odor: None Time: 1420 Appearance: Cloudy

General/Weather Observations

75°F, Sunny, wind 5-10 mph; well fell below 25% of water column. Allowed to recharge and sampled.

Sampler Signature/Date: [signature] 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Static H_2O (ft)
1335	7.5	3938	-36.2	258.0	4.4	21.0	500	41.12
1340	7.6	3893	-32.9	150.4	4.3	21.4	1000	41.48
1345	7.6	3839	-30.5	100.2	4.0	21.8	1500	41.59
1350	7.7	3821	-29.7	67.8	4.2	22.7	2000	41.72
1355	7.7	3813	-28.5	51.7	3.9	23.6	2500	41.83

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								5% N2 H2 (%)
1400	7.7	3798	-27.6	45.7	3.8	24.0	3000	41.96
1405	7.7	3789	-25.9	36.2	3.6	24.1	3500	42.09
→ well under 25% of initial water column.								

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): MSM DAH

Name and Afiliation (Inspector): NA

Well Information

7.38

Well ID: MW-3 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.61 ft Multi Factor*: 0.1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 14.10 ft Casing Volume: 4.81 gallons

Height of Water Column: 29.51 ft Cal. 3 Volumes: 14.43 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: 1457 Finish: 1652 Purge Rate: 100 mL/min

Purging Method: Mega Monsoon Total Volume Purged: 11500 mL ~~gallons~~

Sampling Information

Date Collected: 10/15/15 Time Collected: 1700 am pm

Sampling Equipment Used: Mega Monsoon

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 25.3 Time: 1700 Turbidity (ntu): 10.0 Time: 1700

Sample pH (s.u.): 7.6 Time: 1700 Diss Oxy (mg/L): 2.3 Time: 1700

Specific Cond. (uS): 4366 Time: 1700 Res. Cl (mg/L): — Time: —

ReDox (mV): -19.7 Time: 1700 Other: Fe^{2+} = ND Time: 1700

Odor: None Time: 1700 Appearance: Clear

General/Weather Observations

75°F, Sunny, wind 5-10mph

Sampler Signature/Date: [signature] 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Static H_2O (ft)
1502	7.7	4305	-21.6	32.1	2.9	22.1	500	14.55
1507	7.7	4315	-20.1	71.1	2.7	23.1	1000	14.93
1512	7.7	4314	-21.6	66.6	2.4	23.8	1500	15.20
1517	7.7	4329	-22.1	72.1	2.3	24.6	2000	15.44
1522	7.7	4342	-22.7	64.9	2.3	24.8	2500	15.67

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-3

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Static H2O 16.3
1532	7.6	4356	-22.7	58.2	2.2	25.0	3500	16.19
1542	7.6	4360	-22.8	47.8	2.2	25.1	4500	16.80
1552	7.6	4339	-23.3	31.8	2.0	25.4	5500	17.10
1602	7.6	4365	-22.5	22.6	2.0	25.9	6500	17.51
1612	7.6	4380	-21.9	23.0	2.0	26.3	7500	17.83
1622	7.6	4375	-20.9	13.9	2.1	25.7	8500	18.12
1632	7.6	4354	-20.0	13.3	2.1	25.9	9500	18.51
1642	7.6	4357	-20.0	11.0	2.2	25.7	10500	18.80
1652	7.6	4365	-19.7	10.0	2.2	25.2	11500	19.12

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 09, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on October 15, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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CERTIFICATIONS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92272154001	**SW-2**	Water	10/15/15 11:07	10/15/15 17:45
92272154002	**SW-1**	Water	10/15/15 12:03	10/15/15 17:45
92272154003	**BG-1**	Water	10/15/15 13:24	10/15/15 17:45
92272154004	**MW-4**	Water	10/15/15 16:33	10/15/15 17:45

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SAMPLE ANALYTE COUNT

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92272154001	**SW-2**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272154002	**SW-1**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272154003	**BG-1**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272154004	**MW-4**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272154001	**SW-2**					
EPA 300.0	Chloride	10.2	mg/L	1.0	10/21/15 11:24	
EPA 300.0	Sulfate	28.1	mg/L	1.0	10/21/15 11:24	
EPA 6010	Barium	70.7	ug/L	5.0	10/20/15 20:09	
EPA 6010	Calcium	10000	ug/L	100	10/20/15 20:09	
EPA 6010	Cobalt	5.2	ug/L	5.0	10/20/15 20:09	
EPA 6010	Copper	6.7	ug/L	5.0	10/20/15 20:09	
EPA 6010	Vanadium	6.9	ug/L	5.0	10/20/15 20:09	
EPA 6010	Zinc	18.8	ug/L	10.0	10/20/15 20:09	
EPA 6020A	Boron	30.0	ug/L	5.0	10/27/15 20:52	
EPA 6020A	Lithium	2.8	ug/L	0.50	10/27/15 20:52	
EPA 903.1	Radium-226	-0.344 ± 0.503 (0.973) C:NA T:89%	pCi/L		11/06/15 11:07	
EPA 904.0	Radium-228	0.245 ± 0.330 (0.706) C:80% T:83%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	0.000 ± 0.833 (1.68)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	205	mg/L	25.0	10/19/15 08:41	
92272154002	**SW-1**					
EPA 300.0	Chloride	9.5	mg/L	1.0	10/21/15 12:33	
EPA 300.0	Fluoride	0.12	mg/L	0.10	10/21/15 12:33	
EPA 300.0	Sulfate	8.5	mg/L	1.0	10/21/15 12:33	
EPA 6010	Barium	178	ug/L	5.0	10/20/15 20:17	
EPA 6010	Calcium	3470	ug/L	100	10/20/15 20:17	
EPA 6010	Chromium	5.9	ug/L	5.0	10/20/15 20:17	
EPA 6010	Copper	8.3	ug/L	5.0	10/20/15 20:17	
EPA 6010	Lead	11.6	ug/L	5.0	10/20/15 20:17	
EPA 6010	Vanadium	19.4	ug/L	5.0	10/20/15 20:17	
EPA 6010	Zinc	24.7	ug/L	10.0	10/20/15 20:17	
EPA 6020A	Boron	15.4	ug/L	5.0	10/27/15 20:55	
EPA 6020A	Lithium	5.1	ug/L	0.50	10/27/15 20:55	
EPA 903.1	Radium-226	0.141 ± 0.511 (0.873) C:NA T:95%	pCi/L		11/06/15 10:42	
EPA 904.0	Radium-228	0.644 ± 0.386 (0.708) C:77% T:79%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	0.785 ± 0.897 (1.58)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	382	mg/L	25.0	10/19/15 08:41	

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272154003	**BG-1**					
EPA 300.0	Chloride	311	mg/L	6.0	10/21/15 20:12	
EPA 300.0	Fluoride	0.10	mg/L	0.10	10/21/15 12:56	
EPA 300.0	Sulfate	15.1	mg/L	1.0	10/21/15 12:56	
EPA 6010	Barium	443	ug/L	5.0	10/20/15 20:20	
EPA 6010	Calcium	38200	ug/L	100	10/20/15 20:20	
EPA 6010	Zinc	10.0	ug/L	10.0	10/20/15 20:20	
EPA 6020A	Boron	6.1	ug/L	5.0	10/27/15 20:58	
EPA 6020A	Lithium	14.9	ug/L	0.50	10/27/15 20:58	
EPA 903.1	Radium-226	0.362 ± 0.504 (0.841) C:NA T:90%	pCi/L		11/06/15 11:12	
EPA 904.0	Radium-228	0.723 ± 0.375 (0.657) C:80% T:83%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	1.09 ± 0.879 (1.50)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	654	mg/L	50.0	10/19/15 08:42	
92272154004	**MW-4**					
EPA 300.0	Chloride	344	mg/L	7.0	10/21/15 20:41	
EPA 300.0	Fluoride	0.28	mg/L	0.10	10/21/15 13:19	
EPA 300.0	Sulfate	7.0	mg/L	1.0	10/21/15 13:19	
EPA 6010	Barium	232	ug/L	5.0	10/20/15 20:24	
EPA 6010	Calcium	46200	ug/L	100	10/20/15 20:24	
EPA 6020A	Boron	6.2	ug/L	5.0	10/27/15 21:01	
EPA 6020A	Lithium	20.1	ug/L	0.50	10/27/15 21:01	
EPA 903.1	Radium-226	0.281 ± 0.596 (0.988) C:NA T:91%	pCi/L		11/06/15 10:41	
EPA 904.0	Radium-228	0.0230 ± 0.268 (0.624) C:80% T:83%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	0.304 ± 0.864 (1.61)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	1110	mg/L	250	10/19/15 08:43	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: SW-2 **Lab ID: 92272154001** Collected: 10/15/15 11:07 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**10.2**	mg/L	1.0	1		10/21/15 11:24	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/21/15 11:24	16984-48-8	
Sulfate	**28.1**	mg/L	1.0	1		10/21/15 11:24	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:09	7440-38-2	
Barium	**70.7**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:09	7440-43-9	
Calcium	**10000**	ug/L	100	1	10/19/15 19:30	10/20/15 20:09	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-47-3	
Cobalt	**5.2**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-48-4	
Copper	**6.7**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:09	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:09	7440-28-0	
Vanadium	**6.9**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:09	7440-62-2	
Zinc	**18.8**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:09	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**30.0**	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:52	7440-42-8	
Lithium	**2.8**	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:52	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:15	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 04:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 04:35	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 04:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 04:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 04:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 04:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 04:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 04:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 04:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 04:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 04:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 04:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 04:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 04:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 04:35	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: SW-2 **Lab ID: 92272154001** Collected: 10/15/15 11:07 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 04:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 04:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 04:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 04:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 04:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 04:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 04:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 04:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 04:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 04:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 04:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 04:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 04:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 04:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 04:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 04:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 04:35	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 04:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 04:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 04:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 04:35	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 04:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 04:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 04:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 04:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 04:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 04:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 04:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 04:35	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 04:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		10/18/15 04:35	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		10/18/15 04:35	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		10/18/15 04:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**205**	mg/L	25.0	1		10/19/15 08:41		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: SW-1 **Lab ID: 92272154002** Collected: 10/15/15 12:03 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**9.5**	mg/L	1.0	1		10/21/15 12:33	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		10/21/15 12:33	16984-48-8	
Sulfate	**8.5**	mg/L	1.0	1		10/21/15 12:33	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:17	7440-38-2	
Barium	**178**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:17	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:17	7440-43-9	
Calcium	**3470**	ug/L	100	1	10/19/15 19:30	10/20/15 20:17	7440-70-2	
Chromium	**5.9**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-48-4	
Copper	**8.3**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-50-8	
Lead	**11.6**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:17	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:17	7440-28-0	
Vanadium	**19.4**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:17	7440-62-2	
Zinc	**24.7**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:17	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**15.4**	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:55	7440-42-8	
Lithium	**5.1**	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:55	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:17	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 04:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 04:52	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 04:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 04:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 04:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 04:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 04:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 04:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 04:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 04:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 04:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 04:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 04:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 04:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 04:52	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: SW-1 **Lab ID: 92272154002** Collected: 10/15/15 12:03 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 04:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 04:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 04:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 04:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 04:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 04:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 04:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 04:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 04:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 04:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 04:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 04:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 04:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 04:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 04:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 04:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 04:52	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 04:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 04:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 04:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 04:52	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 04:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 04:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 04:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 04:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 04:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 04:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 04:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 04:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 04:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		10/18/15 04:52	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		10/18/15 04:52	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		10/18/15 04:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**382**	mg/L	25.0	1		10/19/15 08:41		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: BG-1 **Lab ID: 92272154003** Collected: 10/15/15 13:24 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**311**	mg/L	6.0	6		10/21/15 20:12	16887-00-6	
Fluoride	**0.10**	mg/L	0.10	1		10/21/15 12:56	16984-48-8	
Sulfate	**15.1**	mg/L	1.0	1		10/21/15 12:56	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:20	7440-38-2	
Barium	**443**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:20	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:20	7440-43-9	
Calcium	**38200**	ug/L	100	1	10/19/15 19:30	10/20/15 20:20	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:20	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:20	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:20	7440-62-2	
Zinc	**10.0**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:20	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**6.1**	ug/L	5.0	1	10/27/15 10:30	10/27/15 20:58	7440-42-8	
Lithium	**14.9**	ug/L	0.50	1	10/27/15 10:30	10/27/15 20:58	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:20	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 05:10	67-64-1	M1
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 05:10	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 05:10	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 05:10	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 05:10	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 05:10	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 05:10	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 05:10	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 05:10	75-15-0	M1
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 05:10	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 05:10	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 05:10	75-00-3	M1
Chloroform	ND	ug/L	1.0	1		10/18/15 05:10	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 05:10	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 05:10	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: BG-1 **Lab ID: 92272154003** Collected: 10/15/15 13:24 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 05:10	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 05:10	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 05:10	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 05:10	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 05:10	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 05:10	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 05:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 05:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 05:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 05:10	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 05:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 05:10	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 05:10	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 05:10	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 05:10	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 05:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 05:10	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 05:10	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 05:10	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 05:10	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 05:10	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 05:10	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 05:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 05:10	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 05:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 05:10	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 05:10	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 05:10	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 05:10	75-01-4	M1
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 05:10	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		10/18/15 05:10	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		10/18/15 05:10	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/18/15 05:10	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**654**	mg/L	50.0	1		10/19/15 08:42		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: MW-4 **Lab ID: 92272154004** Collected: 10/15/15 16:33 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**344**	mg/L	7.0	7		10/21/15 20:41	16887-00-6	
Fluoride	**0.28**	mg/L	0.10	1		10/21/15 13:19	16984-48-8	
Sulfate	**7.0**	mg/L	1.0	1		10/21/15 13:19	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:24	7440-38-2	
Barium	**232**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:24	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:24	7440-43-9	
Calcium	**46200**	ug/L	100	1	10/19/15 19:30	10/20/15 20:24	7440-70-2	
Chromium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:24	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:24	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:24	7440-62-2	
Zinc	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:24	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**6.2**	ug/L	5.0	1	10/27/15 10:30	10/27/15 21:01	7440-42-8	
Lithium	**20.1**	ug/L	0.50	1	10/27/15 10:30	10/27/15 21:01	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:22	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 05:28	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 05:28	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 05:28	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 05:28	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 05:28	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 05:28	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 05:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 05:28	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 05:28	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 05:28	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 05:28	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 05:28	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 05:28	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 05:28	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 05:28	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: MW-4 **Lab ID: 92272154004** Collected: 10/15/15 16:33 Received: 10/15/15 17:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 05:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 05:28	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 05:28	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 05:28	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 05:28	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 05:28	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 05:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 05:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 05:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 05:28	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 05:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 05:28	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 05:28	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 05:28	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 05:28	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 05:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 05:28	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 05:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 05:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 05:28	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 05:28	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 05:28	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 05:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 05:28	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 05:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 05:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 05:28	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 05:28	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 05:28	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 05:28	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		10/18/15 05:28	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		10/18/15 05:28	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/18/15 05:28	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1110**	mg/L	250	1		10/19/15 08:43		

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: GWD/2594 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 1587393 | Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/21/15 10:39	
Fluoride	mg/L	ND	0.10	10/21/15 10:39	
Sulfate	mg/L	ND	1.0	10/21/15 10:39	

LABORATORY CONTROL SAMPLE: 1587394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.1	98	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	50	47.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587395 1587396

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	10.2	50	50	59.9	60.1	99	100	90-110	0	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	93	95	90-110	2	20	
Sulfate	mg/L	28.1	50	50	77.1	77.3	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587397 1587398

Parameter	Units	92272483001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16.4	50	50	66.1	65.9	99	99	90-110	0	20	
Fluoride	mg/L	0.67	2.5	2.5	3.1	3.1	99	98	90-110	1	20	
Sulfate	mg/L	24.2	50	50	73.0	72.7	98	97	90-110	0	20	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: MERP/8557 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 1586006 Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/20/15 13:03	

LABORATORY CONTROL SAMPLE: 1586007

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586008 1586009

Parameter	Units	92271942001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	92	92	75-125	0	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: MPRP/19840 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 1585679 | Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	10/20/15 20:03	
Arsenic	ug/L	ND	10.0	10/20/15 20:03	
Barium	ug/L	ND	5.0	10/20/15 20:03	
Beryllium	ug/L	ND	1.0	10/20/15 20:03	
Cadmium	ug/L	ND	1.0	10/20/15 20:03	
Calcium	ug/L	ND	100	10/20/15 20:03	
Chromium	ug/L	ND	5.0	10/20/15 20:03	
Cobalt	ug/L	ND	5.0	10/20/15 20:03	
Copper	ug/L	ND	5.0	10/20/15 20:03	
Lead	ug/L	ND	5.0	10/20/15 20:03	
Molybdenum	ug/L	ND	5.0	10/20/15 20:03	
Nickel	ug/L	ND	5.0	10/20/15 20:03	
Selenium	ug/L	ND	10.0	10/20/15 20:03	
Silver	ug/L	ND	5.0	10/20/15 20:03	
Thallium	ug/L	ND	5.4	10/20/15 20:03	
Vanadium	ug/L	ND	5.0	10/20/15 20:03	
Zinc	ug/L	ND	10.0	10/20/15 20:03	

LABORATORY CONTROL SAMPLE: 1585680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	511	102	80-120	
Arsenic	ug/L	500	488	98	80-120	
Barium	ug/L	500	514	103	80-120	
Beryllium	ug/L	500	510	102	80-120	
Cadmium	ug/L	500	509	102	80-120	
Calcium	ug/L	5000	4960	99	80-120	
Chromium	ug/L	500	507	101	80-120	
Cobalt	ug/L	500	501	100	80-120	
Copper	ug/L	500	516	103	80-120	
Lead	ug/L	500	495	99	80-120	
Molybdenum	ug/L	500	536	107	80-120	
Nickel	ug/L	500	505	101	80-120	
Selenium	ug/L	500	495	99	80-120	
Silver	ug/L	250	249	100	80-120	
Thallium	ug/L	500	491	98	80-120	
Vanadium	ug/L	500	495	99	80-120	
Zinc	ug/L	500	485	97	80-120	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1585681 1585682

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	480	474	96	94	75-125	1	25	
Arsenic	ug/L	ND	500	500	478	470	95	93	75-125	2	25	
Barium	ug/L	70.7	500	500	551	535	96	93	75-125	3	25	
Beryllium	ug/L	ND	500	500	468	457	94	91	75-125	2	25	
Cadmium	ug/L	ND	500	500	477	471	95	94	75-125	1	25	
Calcium	ug/L	10000	5000	5000	15900	15400	117	108	75-125	3	25	
Chromium	ug/L	ND	500	500	474	465	94	93	75-125	2	25	
Cobalt	ug/L	5.2	500	500	485	478	96	95	75-125	1	25	
Copper	ug/L	6.7	500	500	495	487	98	96	75-125	2	25	
Lead	ug/L	ND	500	500	474	468	94	93	75-125	1	25	
Molybdenum	ug/L	ND	500	500	508	501	101	100	75-125	1	25	
Nickel	ug/L	ND	500	500	476	467	94	93	75-125	2	25	
Selenium	ug/L	ND	500	500	468	460	94	92	75-125	2	25	
Silver	ug/L	ND	250	250	235	231	94	92	75-125	2	25	
Thallium	ug/L	ND	500	500	457	453	91	90	75-125	1	25	
Vanadium	ug/L	6.9	500	500	483	473	95	93	75-125	2	25	
Zinc	ug/L	18.8	500	500	512	505	99	97	75-125	1	25	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: MPRP/59095 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 2118485 Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	10/27/15 13:46	
Lithium	ug/L	ND	0.50	10/27/15 13:46	

LABORATORY CONTROL SAMPLE: 2118486

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	80.2	100	80-120	
Lithium	ug/L	80	85.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2118487 2118488

Parameter	Units	92272367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	53.1	80	80	161	158	135	132	75-125	2	20	M1
Lithium	ug/L	23.5	80	80	110	107	108	105	75-125	3	20	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: MSV/33856 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 1585329 Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1-Dichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
1,2,3-Trichloropropane	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichloropropane	ug/L	ND	1.0	10/18/15 04:17	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
2-Butanone (MEK)	ug/L	ND	5.0	10/18/15 04:17	
2-Hexanone	ug/L	ND	5.0	10/18/15 04:17	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/18/15 04:17	
Acetone	ug/L	ND	25.0	10/18/15 04:17	
Acrylonitrile	ug/L	ND	10.0	10/18/15 04:17	
Benzene	ug/L	ND	1.0	10/18/15 04:17	
Bromochloromethane	ug/L	ND	1.0	10/18/15 04:17	
Bromodichloromethane	ug/L	ND	1.0	10/18/15 04:17	
Bromoform	ug/L	ND	1.0	10/18/15 04:17	
Bromomethane	ug/L	ND	2.0	10/18/15 04:17	
Carbon disulfide	ug/L	ND	2.0	10/18/15 04:17	
Carbon tetrachloride	ug/L	ND	1.0	10/18/15 04:17	
Chlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
Chloroethane	ug/L	ND	1.0	10/18/15 04:17	
Chloroform	ug/L	ND	1.0	10/18/15 04:17	
Chloromethane	ug/L	ND	1.0	10/18/15 04:17	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/18/15 04:17	
Dibromochloromethane	ug/L	ND	1.0	10/18/15 04:17	
Dibromomethane	ug/L	ND	1.0	10/18/15 04:17	
Ethylbenzene	ug/L	ND	1.0	10/18/15 04:17	
Iodomethane	ug/L	ND	5.0	10/18/15 04:17	
Methylene Chloride	ug/L	ND	1.0	10/18/15 04:17	
Styrene	ug/L	ND	1.0	10/18/15 04:17	
Tetrachloroethene	ug/L	ND	1.0	10/18/15 04:17	
Toluene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	10/18/15 04:17	
Trichloroethene	ug/L	ND	1.0	10/18/15 04:17	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

METHOD BLANK: 1585329 Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	10/18/15 04:17	
Vinyl acetate	ug/L	ND	2.0	10/18/15 04:17	
Vinyl chloride	ug/L	ND	1.0	10/18/15 04:17	
Xylene (Total)	ug/L	ND	2.0	10/18/15 04:17	
1,2-Dichloroethane-d4 (S)	%	104	70-130	10/18/15 04:17	
4-Bromofluorobenzene (S)	%	106	70-130	10/18/15 04:17	
Toluene-d8 (S)	%	100	70-130	10/18/15 04:17	

LABORATORY CONTROL SAMPLE: 1585330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.1	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.7	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	53.3	107	79-124	
1,1,2-Trichloroethane	ug/L	50	48.3	97	85-125	
1,1-Dichloroethane	ug/L	50	50.7	101	73-126	
1,1-Dichloroethene	ug/L	50	54.2	108	66-135	
1,2,3-Trichloropropane	ug/L	50	53.4	107	75-130	
1,2-Dichlorobenzene	ug/L	50	49.1	98	80-133	
1,2-Dichloroethane	ug/L	50	46.5	93	67-128	
1,2-Dichloropropane	ug/L	50	50.2	100	75-132	
1,4-Dichlorobenzene	ug/L	50	49.0	98	78-130	
2-Butanone (MEK)	ug/L	100	108	108	61-144	
2-Hexanone	ug/L	100	116	116	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	112	112	72-135	
Acetone	ug/L	100	112	112	48-146	
Acrylonitrile	ug/L	250	274	109	40-160	
Benzene	ug/L	50	51.2	102	80-125	
Bromochloromethane	ug/L	50	49.1	98	71-125	
Bromodichloromethane	ug/L	50	48.5	97	78-124	
Bromoform	ug/L	50	45.5	91	71-128	
Bromomethane	ug/L	50	43.0	86	40-160	
Carbon disulfide	ug/L	50	54.6	109	50-160	
Carbon tetrachloride	ug/L	50	48.7	97	69-131	
Chlorobenzene	ug/L	50	49.3	99	81-122	
Chloroethane	ug/L	50	40.5	81	39-148	
Chloroform	ug/L	50	47.4	95	73-127	
Chloromethane	ug/L	50	51.4	103	44-146	
cis-1,2-Dichloroethene	ug/L	50	48.6	97	74-124	
cis-1,3-Dichloropropene	ug/L	50	48.8	98	72-132	
Dibromochloromethane	ug/L	50	48.4	97	78-125	
Dibromomethane	ug/L	50	49.7	99	82-120	
Ethylbenzene	ug/L	50	49.9	100	79-121	
Iodomethane	ug/L	100	110	110	39-154	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

LABORATORY CONTROL SAMPLE: 1585330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.8	100	64-133	
Styrene	ug/L	50	51.7	103	84-126	
Tetrachloroethene	ug/L	50	47.3	95	78-122	
Toluene	ug/L	50	49.3	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	50.8	102	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.7	97	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	40.3	81	40-160	
Trichloroethene	ug/L	50	49.4	99	78-122	
Trichlorofluoromethane	ug/L	50	47.9	96	53-137	
Vinyl acetate	ug/L	100	104	104	40-160	
Vinyl chloride	ug/L	50	54.3	109	58-137	
Xylene (Total)	ug/L	150	151	100	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1585331

Parameter	Units	92272154003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.0	105	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.5	107	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.5	103	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,1-Dichloroethene	ug/L	ND	20	29.4	147	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.9	110	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.8	99	70-130	
1,2-Dichloroethane	ug/L	ND	20	20.5	103	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.8	109	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.2	113	70-130	
2-Hexanone	ug/L	ND	40	47.6	119	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	47.5	119	70-130	
Acetone	ug/L	ND	40	53.1	133	70-130	M1
Acrylonitrile	ug/L	ND	100	118	118	70-130	
Benzene	ug/L	ND	20	21.9	110	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.2	101	70-130	
Bromoform	ug/L	ND	20	17.2	86	70-130	
Bromomethane	ug/L	ND	20	21.5	107	70-130	
Carbon disulfide	ug/L	ND	20	29.2	146	70-130	M1
Carbon tetrachloride	ug/L	ND	20	21.7	109	70-130	
Chlorobenzene	ug/L	ND	20	21.8	109	70-146	
Chloroethane	ug/L	ND	20	33.8	169	70-130	M1
Chloroform	ug/L	ND	20	20.6	103	70-130	

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(704)875-9092

QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

MATRIX SPIKE SAMPLE: 1585331

Parameter	Units	92272154003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	25.3	126	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.9	104	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	18.9	94	70-130	
Dibromochloromethane	ug/L	ND	20	18.9	94	70-130	
Dibromomethane	ug/L	ND	20	22.5	113	70-130	
Ethylbenzene	ug/L	ND	20	21.2	106	70-130	
Iodomethane	ug/L	ND	40	41.5	104	70-130	
Methylene Chloride	ug/L	ND	20	24.0	120	70-130	
Styrene	ug/L	ND	20	21.4	107	70-130	
Tetrachloroethene	ug/L	ND	20	21.1	106	70-130	
Toluene	ug/L	ND	20	21.3	107	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.2	106	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.9	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.5	83	70-130	
Trichloroethene	ug/L	ND	20	22.1	110	69-151	
Trichlorofluoromethane	ug/L	ND	20	29.4	147	70-130	M1
Vinyl acetate	ug/L	ND	40	32.4	81	70-130	
Vinyl chloride	ug/L	ND	20	26.9	134	70-130	M1
1,2-Dichloroethane-d4 (S)	%				102	70-130	
4-Bromofluorobenzene (S)	%				112	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1585332

Parameter	Units	92272154004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

SAMPLE DUPLICATE: 1585332

Parameter	Units	92272154004 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	103	101	2		
4-Bromofluorobenzene (S)	%	105	106	2		
Toluene-d8 (S)	%	101	99	2		

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: WET/40905 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 1585450 | Matrix: Water
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	10/19/15 08:38	

LABORATORY CONTROL SAMPLE: 1585451

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	260	104	90-110	

SAMPLE DUPLICATE: 1585452

Parameter	Units	92271800007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1630	2210	30	5	D6

SAMPLE DUPLICATE: 1585453

Parameter	Units	92272150001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	370	383	3	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: SW-2 **Lab ID: 92272154001** Collected: 10/15/15 11:07 Received: 10/15/15 17:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.344 ± 0.503 (0.973) C:NA T:89%**	pCi/L	11/06/15 11:07	13982-63-3	
Radium-228	EPA 904.0	**0.245 ± 0.330 (0.706) C:80% T:83%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**0.000 ± 0.833 (1.68)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: SW-1 **Lab ID: 92272154002** Collected: 10/15/15 12:03 Received: 10/15/15 17:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.141 ± 0.511 (0.873)** **C:NA T:95%**	pCi/L	11/06/15 10:42	13982-63-3	
Radium-228	EPA 904.0	**0.644 ± 0.386 (0.708)** **C:77% T:79%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**0.785 ± 0.897 (1.58)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: BG-1 **Lab ID: 92272154003** Collected: 10/15/15 13:24 Received: 10/15/15 17:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.362 ± 0.504 (0.841)** **C:NA T:90%**	pCi/L	11/06/15 11:12	13982-63-3	
Radium-228	EPA 904.0	**0.723 ± 0.375 (0.657)** **C:80% T:83%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**1.09 ± 0.879 (1.50)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Sample: MW-4 **Lab ID: 92272154004** Collected: 10/15/15 16:33 Received: 10/15/15 17:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.281 ± 0.596 (0.988)** **C:NA T:91%**	pCi/L	11/06/15 10:41	13982-63-3	
Radium-228	EPA 904.0	**0.0230 ± 0.268 (0.624)** **C:80% T:83%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**0.304 ± 0.864 (1.61)**	pCi/L	11/09/15 11:40	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: RADC/26522 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 970745 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0227 ± 0.561 (0.972) C:NA T:92%	pCi/L	11/06/15 10:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

QC Batch: RADC/26588 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92272154001, 92272154002, 92272154003, 92272154004

METHOD BLANK: 973255 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.487 ± 0.362 (0.707) C:82% T:87%	pCi/L	11/04/15 13:00	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272154

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272154001	**SW-2**	EPA 300.0	GWD/2594		
92272154002	**SW-1**	EPA 300.0	GWD/2594		
92272154003	**BG-1**	EPA 300.0	GWD/2594		
92272154004	**MW-4**	EPA 300.0	GWD/2594		
92272154001	**SW-2**	EPA 200.7	MPRP/26987	EPA 200.7	ICP/16273
92272154002	**SW-1**	EPA 200.7	MPRP/26987	EPA 200.7	ICP/16273
92272154003	**BG-1**	EPA 200.7	MPRP/26987	EPA 200.7	ICP/16273
92272154004	**MW-4**	EPA 200.7	MPRP/26987	EPA 200.7	ICP/16273
92272154001	**SW-2**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272154002	**SW-1**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272154003	**BG-1**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272154004	**MW-4**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272154001	**SW-2**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272154002	**SW-1**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272154003	**BG-1**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272154004	**MW-4**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272154001	**SW-2**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272154002	**SW-1**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272154003	**BG-1**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272154004	**MW-4**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272154001	**SW-2**	EPA 8260	MSV/33856		
92272154002	**SW-1**	EPA 8260	MSV/33856		
92272154003	**BG-1**	EPA 8260	MSV/33856		
92272154004	**MW-4**	EPA 8260	MSV/33856		
92272154001	**SW-2**	EPA 903.1	RADC/26522		
92272154002	**SW-1**	EPA 903.1	RADC/26522		
92272154003	**BG-1**	EPA 903.1	RADC/26522		
92272154004	**MW-4**	EPA 903.1	RADC/26522		
92272154001	**SW-2**	EPA 904.0	RADC/26588		
92272154002	**SW-1**	EPA 904.0	RADC/26588		
92272154003	**BG-1**	EPA 904.0	RADC/26588		
92272154004	**MW-4**	EPA 904.0	RADC/26588		
92272154001	**SW-2**	Total Radium Calculation	RADC/26787		
92272154002	**SW-1**	Total Radium Calculation	RADC/26787		
92272154003	**BG-1**	Total Radium Calculation	RADC/26787		
92272154004	**MW-4**	Total Radium Calculation	RADC/26787		
92272154001	**SW-2**	SM 2540C	WET/40905		
92272154002	**SW-1**	SM 2540C	WET/40905		
92272154003	**BG-1**	SM 2540C	WET/40905		
92272154004	**MW-4**	SM 2540C	WET/40905		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 16, 2016 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USP ☐ Client ☐ Commercial ☐ Pace Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun **T1402** **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

Temp Correction Factor **T1402** No Correction

Corrected Cooler Temp.: 5.9 **°C** **Biological Tissue is Frozen:** Yes No N/A

Date and Initials of person examining contents: AP 10-16-15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☐Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☐No ☐N/A	7.
Sufficient Volume:	☐Yes ☐No ☐N/A	8.
Correct Containers Used:	☐Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☐N/A	11.
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☐Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☐N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: JD **Date:** 10/16/15

SRF Review: JD **Date:** 10/16/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92272154

92272154

(If no label, ...)

Pace Analytical®
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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1821676

Section A Required Client Information:

Company: HDR
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name: Brickhaven - Charlotte
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226	Metals	Chloride/Sulfate	TDS	Fluoride	VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92272154
1	SW-2		G			10/15/15	1107		11	3		5	3					3	2	1	1	1	3		001
2	SW-1		G			10/15/15	1203		11	3		5	3					3	2	1	1	1	3		002
3	BG-1		G			10/15/15	1324		11	3		5	3					3	2	1	1	1	3		003
4	MW-4		G			10/15/15	1633		11	3		5	3					3	2	1	1	1	3		004
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	10/15/15	1745	[illegible]	10-15-15	1745	5.4	✓	✓	✓

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 10/15/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven/Charrah

Name and Afiliation (Sampler(s)): C.S, J.A / PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: BG-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.79 ft Multi Factor*: 0.1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 12.49 ft Casing Volume: 5.1019 gallons

Height of Water Column: 31.3 ft Cal. 3 Volumes: 15.3057 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: 1244 Finish: 1324 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 4000 ~~gallons~~ mL

Sampling Information

Date Collected: 10/15/15 Time Collected: 1324 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226 x3
		metals x2, chloride/sulfate,
		fluoride, TDS
		VOC x3

Field Measurements/Observations

Sample Temp (°C): 18.8 Time: 1324

Sample pH (s.u.): 6.24 Time: |

Specific Cond. (uS): 1377 Time: |

ReDox (mV): 230.3 Time: |

Odor: None Time: |

Turbidity (ntu): 3.66 Time: 1324

Diss Oxy (mg/L): 1.52 Time: 1324

Res. Cl (mg/L): — Time: —

Other: Iron: 0.0 mg/L Time: 1324

Appearance: Clear

General/Weather Observations

Near front gate, shaded area. 72°F.

Sampler Signature/Date: [signature] / 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1249	6.21	1397	205.9	36.19	2.45	18.3	500 mL/min	12.90
1254	6.25	1409	228.5	11.46	2.14	18.7	1000 mL	12.90
1259	6.24	1401	239.2	13.09	1.74	18.7	1500 mL	12.90
1304	6.25	1393	237.1	8.63	1.72	18.8	2000 mL	12.91
1309	6.24	1388	235.2	5.93	1.60	18.8	2500 mL	12.91

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Monroe, NC

Project: Brickhaven Charrah

Well ID: BG-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1314	6.24	1384	233.8	4.67	1.50	18.8	3000mL	12.91
1319	6.24	1379	231.8	4.40	1.53	18.8	3500mL	12.91
1324	6.24	1377	230.3	3.66	1.52	18.8	4000mL	12.91

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven / Charrah

Name and Afiliation (Sampler(s): C.S, J.A/PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-1 Well Locked: YES NO

Well Diameter: ___ Construction: PVC Steel Stainless Steel

Total Well Depth: ___ ft Multi Factor*: ___ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ___ ft Casing Volume: ___ gallons

Height of Water Column: ___ ft Cal. 3 Volumes: ___ gallons

Purge Information

Date Purged: ___/___/___ Start Time: ___ Finish: ___ Purge Rate: ___

Purging Method: ___ Total Volume Purged: ___ gallons

Sampling Information

Date Collected: 10/15/15 Time Collected: 1203 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226x3,
		metals x2, Chloride/Sulfate,
		Flouride, TDS, VOCx3

Field Measurements/Observations

Sample Temp (°C): 15.2 Time: 1203

Sample pH (s.u.): 6.46 Time: —

Specific Cond. (uS): 82.0 Time: —

ReDox (mV): 164.1 Time: —

Odor: None Time: —

Turbidity (ntu): 383.5 Time: 1203

Diss Oxy (mg/L): 9.42 Time: —

Res. Cl (mg/L): — Time: —

Other: Iron: 0.0 mg/L Time: —

Appearance: Muddy / Cloudy

General/Weather Observations

Wooded area, near road.

Sampler Signature/Date: Chris Sorrell 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: NDR Location: Monroe, NC Project Name/#: Brickhaven/Charrah

Name and Afiliation (Sampler(s): C.S, J.A/PAE

Name and Afiliation (Inspector): ___

Well Information

Well ID: SW-2 Well Locked: YES NO

Well Diameter: ___ Construction: PVC Steel Stainless Steel

Total Well Depth: ___ ft Multi Factor*: ___ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ___ ft Casing Volume: ___ gallons

Height of Water Column: ___ ft Cal. 3 Volumes: ___ gallons

Purge Information

Date Purged: ___/___/___ Start Time: ___ Finish: ___ Purge Rate: ___

Purging Method: ___ Total Volume Purged: ___ gallons

Sampling Information

Date Collected: 10/15/15 Time Collected: 1107 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium x3, metals x2,
		Chloride/Sulfate
		Fluride, TDS
		VOCx3

Field Measurements/Observations

Sample Temp (°C): 16.9 Time: 1107

Sample pH (s.u.): 6.21 Time: 1107

Specific Cond. (uS): 171.9 Time: 1107

ReDox (mV): 147.6 Time: 1107

Odor: None Time: 1107

Turbidity (ntu): 90.46 Time: 1107

Diss Oxy (mg/L): 7.10 Time: 1107

Res. Cl (mg/L): — Time: ___

Other: Iron: 0.0mg/L Time: 1107

Appearance: Dirty/Cloudy/Muddy

General/Weather Observations

Sunny, 75°F. Wooded area. Near factory/Powerline

Sampler Signature/Date: [signature] / 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven/Charrah

Name and Afiliation (Sampler(s): C.S., J.A/PACE

Name and Afiliation (Inspector):

Well Information

Well ID: MW-4 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 25.72 ft Multi Factor*: 1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.76 ft Casing Volume: 2.43848 gallons

Height of Water Column: 14.96 ft Cal. 3 Volumes: 7.31544 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: ~~1503~~ 1503 08 10/15/15 Finish: 1633 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 9000 mL ~~gallons~~

Sampling Information

Date Collected: 10/15/15 Time Collected: 1633 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium x3, metals x2, Chloride/sulfate, Flouride, TDS, VOC x3

Field Measurements/Observations

Sample Temp (°C): 22.3 Time: 1633 Turbidity (ntu): 8.18 Time: 1633

Sample pH (s.u.): 6.17 Time: Diss Oxy (mg/L): 0.41 Time: 1633

Specific Cond. (uS): 1807 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): -41.6 Time: Other: Iron, 3.8 mg/L Time: 1633

Odor: None Time: Appearance:

General/Weather Observations

Near muddy pond. Sunny 70°F.

Sampler Signature/Date: [signature] 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
1508	6.24	1934	-65.7	32.18	1.58	21.9	500mL	Water Level: 11.18 ft
1513	6.25	1948	-66.8	47.36	1.13	22.3	1000mL	11.21 ft
1518	6.25	1932	-65.7	35.47	0.85	22.4	1500mL	11.21 ft
1523	6.22	1898	-59.6	28.55	0.70	22.3	2000mL	11.21 ft
1528	6.20	1877	-55.2	25.58	0.58	22.4	2500mL	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Mancure, NC

Project: Brickhaven - Charrah

Well ID: MW-4

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
				20.46				water level (ft)
1533	6.19	1865	-53.9	~~0.55~~ 0.55	0.55	22.6	3000mL	11.22
1538	6.19	1865	-54.1	22.25	0.56	22.4	3500mL	11.22
1543	6.19	1865	-51.3	17.59	0.56	22.5	4000mL	11.22
1548	6.18	1843	-50.4	15.27	0.47	22.5	4500mL	11.23
1553	6.18	1836	-49.4	16.08	0.50	22.5	5000mL	11.23
1603	6.18	1824	-46.9	13.00	0.43	22.4	6000mL	11.24
1613	6.18	1809	-45.2	12.24	0.40	22.3	7000mL	11.24
1623	6.17	1810	-44.2	10.99	0.43	22.3	8000mL	11.25
1633	6.17	1807	-41.6	8.18	0.41	22.3	9000mL	11.25

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 09, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on October 15, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs
Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs
9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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CERTIFICATIONS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92272155001	**MW-5**	Water	10/15/15 13:20	10/15/15 21:00
92272155002	**MW-8**	Water	10/15/15 16:40	10/15/15 21:00
92272155003	**MW-5 DUP**	Water	10/15/15 13:25	10/15/15 21:00

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SAMPLE ANALYTE COUNT

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92272155001	**MW-5**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272155002	**MW-8**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92272155003	**MW-5 DUP**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272155001	**MW-5**					
EPA 300.0	Chloride	22.2	mg/L	1.0	10/21/15 16:45	
EPA 300.0	Fluoride	0.59	mg/L	0.10	10/21/15 16:45	
EPA 300.0	Sulfate	3.7	mg/L	1.0	10/21/15 16:45	
EPA 6010	Barium	306	ug/L	5.0	10/20/15 20:55	
EPA 6010	Calcium	16900	ug/L	100	10/20/15 20:55	
EPA 6010	Chromium	10.8	ug/L	5.0	10/20/15 20:55	
EPA 6010	Cobalt	7.0	ug/L	5.0	10/20/15 20:55	
EPA 6010	Copper	16.4	ug/L	5.0	10/20/15 20:55	
EPA 6010	Lead	6.3	ug/L	5.0	10/20/15 20:55	
EPA 6010	Nickel	12.6	ug/L	5.0	10/20/15 20:55	
EPA 6010	Vanadium	9.9	ug/L	5.0	10/20/15 20:55	
EPA 6010	Zinc	106	ug/L	10.0	10/20/15 20:55	
EPA 6020A	Boron	9.0	ug/L	5.0	10/27/15 13:51	
EPA 6020A	Lithium	7.5	ug/L	0.50	10/27/15 13:51	
EPA 903.1	Radium-226	0.708 ± 0.497 (0.240) C:NA T:96%	pCi/L		11/06/15 10:54	
EPA 904.0	Radium-228	0.331 ± 0.326 (0.670) C:75% T:91%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	1.04 ± 0.823 (0.910)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	296	mg/L	25.0	10/19/15 08:49	
92272155002	**MW-8**					
EPA 300.0	Chloride	515	mg/L	10.0	10/22/15 12:46	
EPA 300.0	Sulfate	6.1	mg/L	1.0	10/21/15 17:08	
EPA 6010	Antimony	6.3	ug/L	5.0	10/20/15 20:58	
EPA 6010	Barium	1240	ug/L	5.0	10/20/15 20:58	
EPA 6010	Calcium	117000	ug/L	1000	10/21/15 14:33	
EPA 6010	Chromium	33.9	ug/L	5.0	10/20/15 20:58	
EPA 6010	Nickel	18.2	ug/L	5.0	10/20/15 20:58	
EPA 6010	Zinc	12.0	ug/L	10.0	10/20/15 20:58	
EPA 6020A	Boron	6.3	ug/L	5.0	10/27/15 13:54	
EPA 6020A	Lithium	27.4	ug/L	0.50	10/27/15 13:54	
EPA 903.1	Radium-226	0.0774 ± 0.402 (0.833) C:NA T:98%	pCi/L		11/06/15 10:59	
EPA 904.0	Radium-228	0.809 ± 0.403 (0.698) C:77% T:86%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	0.886 ± 0.805 (1.53)	pCi/L		11/09/15 11:40	

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SUMMARY OF DETECTION

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272155002	**MW-8**					
SM 2540C	Total Dissolved Solids	1560	mg/L	250	10/19/15 08:50	
92272155003	**MW-5 DUP**					
EPA 300.0	Chloride	22.2	mg/L	1.0	10/21/15 17:31	
EPA 300.0	Fluoride	0.60	mg/L	0.10	10/21/15 17:31	
EPA 300.0	Sulfate	3.6	mg/L	1.0	10/21/15 17:31	
EPA 6010	Barium	117	ug/L	5.0	10/20/15 21:01	
EPA 6010	Calcium	14800	ug/L	100	10/20/15 21:01	
EPA 6010	Chromium	18.7	ug/L	5.0	10/20/15 21:01	
EPA 6010	Nickel	13.1	ug/L	5.0	10/20/15 21:01	
EPA 6010	Zinc	37.8	ug/L	10.0	10/20/15 21:01	
EPA 6020A	Boron	8.6	ug/L	5.0	10/27/15 13:56	
EPA 6020A	Lithium	8.0	ug/L	0.50	10/27/15 13:56	
EPA 903.1	Radium-226	0.196 ± 0.599 (0.996) C:NA T:92%	pCi/L		11/06/15 11:22	
EPA 904.0	Radium-228	0.211 ± 0.321 (0.694) C:78% T:86%	pCi/L		11/04/15 11:56	
Total Radium Calculation	Total Radium	0.407 ± 0.920 (1.69)	pCi/L		11/09/15 11:40	
SM 2540C	Total Dissolved Solids	300	mg/L	25.0	10/19/15 08:51	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-5 **Lab ID: 92272155001** Collected: 10/15/15 13:20 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**22.2**	mg/L	1.0	1		10/21/15 16:45	16887-00-6	
Fluoride	**0.59**	mg/L	0.10	1		10/21/15 16:45	16984-48-8	
Sulfate	**3.7**	mg/L	1.0	1		10/21/15 16:45	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:55	7440-38-2	
Barium	**306**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:55	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:55	7440-43-9	
Calcium	**16900**	ug/L	100	1	10/19/15 19:30	10/20/15 20:55	7440-70-2	
Chromium	**10.8**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-47-3	
Cobalt	**7.0**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-48-4	
Copper	**16.4**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-50-8	
Lead	**6.3**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7439-98-7	
Nickel	**12.6**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:55	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:55	7440-28-0	
Vanadium	**9.9**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:55	7440-62-2	
Zinc	**106**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:55	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**9.0**	ug/L	5.0	1	10/27/15 10:30	10/27/15 13:51	7440-42-8	
Lithium	**7.5**	ug/L	0.50	1	10/27/15 10:30	10/27/15 13:51	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:44	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 07:49	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 07:49	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 07:49	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 07:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 07:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 07:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 07:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 07:49	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 07:49	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 07:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 07:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 07:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 07:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 07:49	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 07:49	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-5 **Lab ID: 92272155001** Collected: 10/15/15 13:20 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 07:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 07:49	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 07:49	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 07:49	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 07:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 07:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 07:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 07:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 07:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 07:49	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 07:49	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 07:49	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 07:49	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 07:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 07:49	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 07:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 07:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 07:49	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 07:49	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 07:49	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 07:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 07:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 07:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 07:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 07:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 07:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 07:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 07:49	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		10/18/15 07:49	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		10/18/15 07:49	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/18/15 07:49	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**296**	mg/L	25.0	1		10/19/15 08:49		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-8 **Lab ID: 92272155002** Collected: 10/15/15 16:40 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**515**	mg/L	10.0	10		10/22/15 12:46	16887-00-6	
Fluoride	ND	mg/L	0.10	1		10/21/15 17:08	16984-48-8	
Sulfate	**6.1**	mg/L	1.0	1		10/21/15 17:08	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	**6.3**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:58	7440-38-2	
Barium	**1240**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:58	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 20:58	7440-43-9	
Calcium	**117000**	ug/L	1000	10	10/19/15 19:30	10/21/15 14:33	7440-70-2	
Chromium	**33.9**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7439-98-7	
Nickel	**18.2**	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:58	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 20:58	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 20:58	7440-62-2	
Zinc	**12.0**	ug/L	10.0	1	10/19/15 19:30	10/20/15 20:58	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**6.3**	ug/L	5.0	1	10/27/15 10:30	10/27/15 13:54	7440-42-8	
Lithium	**27.4**	ug/L	0.50	1	10/27/15 10:30	10/27/15 13:54	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:46	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 08:07	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 08:07	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 08:07	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 08:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 08:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 08:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 08:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 08:07	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 08:07	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 08:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 08:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 08:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 08:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 08:07	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 08:07	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-8 **Lab ID: 92272155002** Collected: 10/15/15 16:40 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 08:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 08:07	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 08:07	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 08:07	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 08:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 08:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 08:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 08:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 08:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 08:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 08:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 08:07	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 08:07	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 08:07	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 08:07	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 08:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 08:07	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 08:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 08:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 08:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 08:07	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 08:07	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 08:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 08:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 08:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 08:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 08:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 08:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 08:07	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 08:07	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		10/18/15 08:07	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		10/18/15 08:07	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		10/18/15 08:07	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1560**	mg/L	250	1		10/19/15 08:50		

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-5 DUP **Lab ID: 92272155003** Collected: 10/15/15 13:25 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**22.2**	mg/L	1.0	1		10/21/15 17:31	16887-00-6	
Fluoride	**0.60**	mg/L	0.10	1		10/21/15 17:31	16984-48-8	
Sulfate	**3.6**	mg/L	1.0	1		10/21/15 17:31	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 21:01	7440-38-2	
Barium	**117**	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 21:01	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/19/15 19:30	10/20/15 21:01	7440-43-9	
Calcium	**14800**	ug/L	100	1	10/19/15 19:30	10/20/15 21:01	7440-70-2	
Chromium	**18.7**	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-48-4	
Copper	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-50-8	
Lead	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7439-98-7	
Nickel	**13.1**	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/19/15 19:30	10/20/15 21:01	7782-49-2	
Silver	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/19/15 19:30	10/20/15 21:01	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/19/15 19:30	10/20/15 21:01	7440-62-2	
Zinc	**37.8**	ug/L	10.0	1	10/19/15 19:30	10/20/15 21:01	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**8.6**	ug/L	5.0	1	10/27/15 10:30	10/27/15 13:56	7440-42-8	
Lithium	**8.0**	ug/L	0.50	1	10/27/15 10:30	10/27/15 13:56	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/19/15 17:30	10/20/15 13:48	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/18/15 08:24	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/18/15 08:24	107-13-1	
Benzene	ND	ug/L	1.0	1		10/18/15 08:24	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/18/15 08:24	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/18/15 08:24	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/18/15 08:24	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/18/15 08:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/18/15 08:24	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/18/15 08:24	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/18/15 08:24	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/18/15 08:24	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/18/15 08:24	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/18/15 08:24	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/18/15 08:24	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/18/15 08:24	124-48-1	

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ANALYTICAL RESULTS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-5 DUP **Lab ID: 92272155003** Collected: 10/15/15 13:25 Received: 10/15/15 21:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/18/15 08:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 08:24	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/18/15 08:24	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/18/15 08:24	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/18/15 08:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/18/15 08:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/18/15 08:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 08:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/18/15 08:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/18/15 08:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 08:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/18/15 08:24	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/18/15 08:24	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/18/15 08:24	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/18/15 08:24	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/18/15 08:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/18/15 08:24	108-10-1	
Styrene	ND	ug/L	1.0	1		10/18/15 08:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 08:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/18/15 08:24	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/18/15 08:24	127-18-4	
Toluene	ND	ug/L	1.0	1		10/18/15 08:24	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/18/15 08:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/18/15 08:24	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/18/15 08:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/18/15 08:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/18/15 08:24	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/18/15 08:24	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/18/15 08:24	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/18/15 08:24	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	109	%	70-130	1		10/18/15 08:24	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		10/18/15 08:24	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		10/18/15 08:24	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**300**	mg/L	25.0	1		10/19/15 08:51		

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: GWD/2594 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 1587393 | Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/21/15 10:39	
Fluoride	mg/L	ND	0.10	10/21/15 10:39	
Sulfate	mg/L	ND	1.0	10/21/15 10:39	

LABORATORY CONTROL SAMPLE: 1587394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.1	98	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	50	47.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587395 1587396

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	10.2	50	50	59.9	60.1	99	100	90-110	0	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	93	95	90-110	2	20	
Sulfate	mg/L	28.1	50	50	77.1	77.3	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587397 1587398

Parameter	Units	92272483001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16.4	50	50	66.1	65.9	99	99	90-110	0	20	
Fluoride	mg/L	0.67	2.5	2.5	3.1	3.1	99	98	90-110	1	20	
Sulfate	mg/L	24.2	50	50	73.0	72.7	98	97	90-110	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: MERP/8557 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 1586006 Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/20/15 13:03	

LABORATORY CONTROL SAMPLE: 1586007

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586008 1586009

Parameter	Units	92271942001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	92	92	75-125	0	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: MPRP/19840 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 1585679 | Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	10/20/15 20:03	
Arsenic	ug/L	ND	10.0	10/20/15 20:03	
Barium	ug/L	ND	5.0	10/20/15 20:03	
Beryllium	ug/L	ND	1.0	10/20/15 20:03	
Cadmium	ug/L	ND	1.0	10/20/15 20:03	
Calcium	ug/L	ND	100	10/20/15 20:03	
Chromium	ug/L	ND	5.0	10/20/15 20:03	
Cobalt	ug/L	ND	5.0	10/20/15 20:03	
Copper	ug/L	ND	5.0	10/20/15 20:03	
Lead	ug/L	ND	5.0	10/20/15 20:03	
Molybdenum	ug/L	ND	5.0	10/20/15 20:03	
Nickel	ug/L	ND	5.0	10/20/15 20:03	
Selenium	ug/L	ND	10.0	10/20/15 20:03	
Silver	ug/L	ND	5.0	10/20/15 20:03	
Thallium	ug/L	ND	5.4	10/20/15 20:03	
Vanadium	ug/L	ND	5.0	10/20/15 20:03	
Zinc	ug/L	ND	10.0	10/20/15 20:03	

LABORATORY CONTROL SAMPLE: 1585680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	511	102	80-120	
Arsenic	ug/L	500	488	98	80-120	
Barium	ug/L	500	514	103	80-120	
Beryllium	ug/L	500	510	102	80-120	
Cadmium	ug/L	500	509	102	80-120	
Calcium	ug/L	5000	4960	99	80-120	
Chromium	ug/L	500	507	101	80-120	
Cobalt	ug/L	500	501	100	80-120	
Copper	ug/L	500	516	103	80-120	
Lead	ug/L	500	495	99	80-120	
Molybdenum	ug/L	500	536	107	80-120	
Nickel	ug/L	500	505	101	80-120	
Selenium	ug/L	500	495	99	80-120	
Silver	ug/L	250	249	100	80-120	
Thallium	ug/L	500	491	98	80-120	
Vanadium	ug/L	500	495	99	80-120	
Zinc	ug/L	500	485	97	80-120	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1585681 1585682

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	480	474	96	94	75-125	1	25	
Arsenic	ug/L	ND	500	500	478	470	95	93	75-125	2	25	
Barium	ug/L	70.7	500	500	551	535	96	93	75-125	3	25	
Beryllium	ug/L	ND	500	500	468	457	94	91	75-125	2	25	
Cadmium	ug/L	ND	500	500	477	471	95	94	75-125	1	25	
Calcium	ug/L	10000	5000	5000	15900	15400	117	108	75-125	3	25	
Chromium	ug/L	ND	500	500	474	465	94	93	75-125	2	25	
Cobalt	ug/L	5.2	500	500	485	478	96	95	75-125	1	25	
Copper	ug/L	6.7	500	500	495	487	98	96	75-125	2	25	
Lead	ug/L	ND	500	500	474	468	94	93	75-125	1	25	
Molybdenum	ug/L	ND	500	500	508	501	101	100	75-125	1	25	
Nickel	ug/L	ND	500	500	476	467	94	93	75-125	2	25	
Selenium	ug/L	ND	500	500	468	460	94	92	75-125	2	25	
Silver	ug/L	ND	250	250	235	231	94	92	75-125	2	25	
Thallium	ug/L	ND	500	500	457	453	91	90	75-125	1	25	
Vanadium	ug/L	6.9	500	500	483	473	95	93	75-125	2	25	
Zinc	ug/L	18.8	500	500	512	505	99	97	75-125	1	25	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: MPRP/59095 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 2118485 Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	10/27/15 13:46	
Lithium	ug/L	ND	0.50	10/27/15 13:46	

LABORATORY CONTROL SAMPLE: 2118486

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	80.2	100	80-120	
Lithium	ug/L	80	85.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2118487 2118488

Parameter	Units	92272367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	53.1	80	80	161	158	135	132	75-125	2	20	M1
Lithium	ug/L	23.5	80	80	110	107	108	105	75-125	3	20	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: MSV/33856 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 1585329 Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1-Dichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,1-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
1,2,3-Trichloropropane	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichloroethane	ug/L	ND	1.0	10/18/15 04:17	
1,2-Dichloropropane	ug/L	ND	1.0	10/18/15 04:17	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
2-Butanone (MEK)	ug/L	ND	5.0	10/18/15 04:17	
2-Hexanone	ug/L	ND	5.0	10/18/15 04:17	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/18/15 04:17	
Acetone	ug/L	ND	25.0	10/18/15 04:17	
Acrylonitrile	ug/L	ND	10.0	10/18/15 04:17	
Benzene	ug/L	ND	1.0	10/18/15 04:17	
Bromochloromethane	ug/L	ND	1.0	10/18/15 04:17	
Bromodichloromethane	ug/L	ND	1.0	10/18/15 04:17	
Bromoform	ug/L	ND	1.0	10/18/15 04:17	
Bromomethane	ug/L	ND	2.0	10/18/15 04:17	
Carbon disulfide	ug/L	ND	2.0	10/18/15 04:17	
Carbon tetrachloride	ug/L	ND	1.0	10/18/15 04:17	
Chlorobenzene	ug/L	ND	1.0	10/18/15 04:17	
Chloroethane	ug/L	ND	1.0	10/18/15 04:17	
Chloroform	ug/L	ND	1.0	10/18/15 04:17	
Chloromethane	ug/L	ND	1.0	10/18/15 04:17	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/18/15 04:17	
Dibromochloromethane	ug/L	ND	1.0	10/18/15 04:17	
Dibromomethane	ug/L	ND	1.0	10/18/15 04:17	
Ethylbenzene	ug/L	ND	1.0	10/18/15 04:17	
Iodomethane	ug/L	ND	5.0	10/18/15 04:17	
Methylene Chloride	ug/L	ND	1.0	10/18/15 04:17	
Styrene	ug/L	ND	1.0	10/18/15 04:17	
Tetrachloroethene	ug/L	ND	1.0	10/18/15 04:17	
Toluene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/18/15 04:17	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	10/18/15 04:17	
Trichloroethene	ug/L	ND	1.0	10/18/15 04:17	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

METHOD BLANK: 1585329 Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	10/18/15 04:17	
Vinyl acetate	ug/L	ND	2.0	10/18/15 04:17	
Vinyl chloride	ug/L	ND	1.0	10/18/15 04:17	
Xylene (Total)	ug/L	ND	2.0	10/18/15 04:17	
1,2-Dichloroethane-d4 (S)	%	104	70-130	10/18/15 04:17	
4-Bromofluorobenzene (S)	%	106	70-130	10/18/15 04:17	
Toluene-d8 (S)	%	100	70-130	10/18/15 04:17	

LABORATORY CONTROL SAMPLE: 1585330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.1	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.7	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	53.3	107	79-124	
1,1,2-Trichloroethane	ug/L	50	48.3	97	85-125	
1,1-Dichloroethane	ug/L	50	50.7	101	73-126	
1,1-Dichloroethene	ug/L	50	54.2	108	66-135	
1,2,3-Trichloropropane	ug/L	50	53.4	107	75-130	
1,2-Dichlorobenzene	ug/L	50	49.1	98	80-133	
1,2-Dichloroethane	ug/L	50	46.5	93	67-128	
1,2-Dichloropropane	ug/L	50	50.2	100	75-132	
1,4-Dichlorobenzene	ug/L	50	49.0	98	78-130	
2-Butanone (MEK)	ug/L	100	108	108	61-144	
2-Hexanone	ug/L	100	116	116	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	112	112	72-135	
Acetone	ug/L	100	112	112	48-146	
Acrylonitrile	ug/L	250	274	109	40-160	
Benzene	ug/L	50	51.2	102	80-125	
Bromochloromethane	ug/L	50	49.1	98	71-125	
Bromodichloromethane	ug/L	50	48.5	97	78-124	
Bromoform	ug/L	50	45.5	91	71-128	
Bromomethane	ug/L	50	43.0	86	40-160	
Carbon disulfide	ug/L	50	54.6	109	50-160	
Carbon tetrachloride	ug/L	50	48.7	97	69-131	
Chlorobenzene	ug/L	50	49.3	99	81-122	
Chloroethane	ug/L	50	40.5	81	39-148	
Chloroform	ug/L	50	47.4	95	73-127	
Chloromethane	ug/L	50	51.4	103	44-146	
cis-1,2-Dichloroethene	ug/L	50	48.6	97	74-124	
cis-1,3-Dichloropropene	ug/L	50	48.8	98	72-132	
Dibromochloromethane	ug/L	50	48.4	97	78-125	
Dibromomethane	ug/L	50	49.7	99	82-120	
Ethylbenzene	ug/L	50	49.9	100	79-121	
Iodomethane	ug/L	100	110	110	39-154	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

LABORATORY CONTROL SAMPLE: 1585330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.8	100	64-133	
Styrene	ug/L	50	51.7	103	84-126	
Tetrachloroethene	ug/L	50	47.3	95	78-122	
Toluene	ug/L	50	49.3	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	50.8	102	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.7	97	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	40.3	81	40-160	
Trichloroethene	ug/L	50	49.4	99	78-122	
Trichlorofluoromethane	ug/L	50	47.9	96	53-137	
Vinyl acetate	ug/L	100	104	104	40-160	
Vinyl chloride	ug/L	50	54.3	109	58-137	
Xylene (Total)	ug/L	150	151	100	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1585331

Parameter	Units	92272154003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.0	105	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.5	107	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.5	103	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,1-Dichloroethene	ug/L	ND	20	29.4	147	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.9	110	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.8	99	70-130	
1,2-Dichloroethane	ug/L	ND	20	20.5	103	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.8	109	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.2	113	70-130	
2-Hexanone	ug/L	ND	40	47.6	119	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	47.5	119	70-130	
Acetone	ug/L	ND	40	53.1	133	70-130	M1
Acrylonitrile	ug/L	ND	100	118	118	70-130	
Benzene	ug/L	ND	20	21.9	110	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.2	101	70-130	
Bromoform	ug/L	ND	20	17.2	86	70-130	
Bromomethane	ug/L	ND	20	21.5	107	70-130	
Carbon disulfide	ug/L	ND	20	29.2	146	70-130	M1
Carbon tetrachloride	ug/L	ND	20	21.7	109	70-130	
Chlorobenzene	ug/L	ND	20	21.8	109	70-146	
Chloroethane	ug/L	ND	20	33.8	169	70-130	M1
Chloroform	ug/L	ND	20	20.6	103	70-130	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

MATRIX SPIKE SAMPLE: 1585331

Parameter	Units	92272154003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	25.3	126	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.9	104	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	18.9	94	70-130	
Dibromochloromethane	ug/L	ND	20	18.9	94	70-130	
Dibromomethane	ug/L	ND	20	22.5	113	70-130	
Ethylbenzene	ug/L	ND	20	21.2	106	70-130	
Iodomethane	ug/L	ND	40	41.5	104	70-130	
Methylene Chloride	ug/L	ND	20	24.0	120	70-130	
Styrene	ug/L	ND	20	21.4	107	70-130	
Tetrachloroethene	ug/L	ND	20	21.1	106	70-130	
Toluene	ug/L	ND	20	21.3	107	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.2	106	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.9	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.5	83	70-130	
Trichloroethene	ug/L	ND	20	22.1	110	69-151	
Trichlorofluoromethane	ug/L	ND	20	29.4	147	70-130	M1
Vinyl acetate	ug/L	ND	40	32.4	81	70-130	
Vinyl chloride	ug/L	ND	20	26.9	134	70-130	M1
1,2-Dichloroethane-d4 (S)	%				102	70-130	
4-Bromofluorobenzene (S)	%				112	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1585332

Parameter	Units	92272154004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

SAMPLE DUPLICATE: 1585332

Parameter	Units	92272154004 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	103	101	2		
4-Bromofluorobenzene (S)	%	105	106	2		
Toluene-d8 (S)	%	101	99	2		

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QUALITY CONTROL DATA

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: WET/40905 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 1585450 Matrix: Water
Associated Lab Samples: 92272155001, 92272155002, 92272155003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	10/19/15 08:38	

LABORATORY CONTROL SAMPLE: 1585451

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	260	104	90-110	

SAMPLE DUPLICATE: 1585452

Parameter	Units	92271800007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1630	2210	30	5	D6

SAMPLE DUPLICATE: 1585453

Parameter	Units	92272150001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	370	383	3	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-5 **Lab ID: 92272155001** Collected: 10/15/15 13:20 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.708 ± 0.497 (0.240)** **C:NA T:96%**	pCi/L	11/06/15 10:54	13982-63-3	
Radium-228	EPA 904.0	**0.331 ± 0.326 (0.670)** **C:75% T:91%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**1.04 ± 0.823 (0.910)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-8 **Lab ID: 92272155002** Collected: 10/15/15 16:40 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0774 ± 0.402 (0.833)** **C:NA T:98%**	pCi/L	11/06/15 10:59	13982-63-3	
Radium-228	EPA 904.0	**0.809 ± 0.403 (0.698)** **C:77% T:86%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**0.886 ± 0.805 (1.53)**	pCi/L	11/09/15 11:40	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Sample: MW-5 DUP **Lab ID: 92272155003** Collected: 10/15/15 13:25 Received: 10/15/15 21:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.196 ± 0.599 (0.996)** **C:NA T:92%**	pCi/L	11/06/15 11:22	13982-63-3	
Radium-228	EPA 904.0	**0.211 ± 0.321 (0.694)** **C:78% T:86%**	pCi/L	11/04/15 11:56	15262-20-1	
Total Radium	Total Radium Calculation	**0.407 ± 0.920 (1.69)**	pCi/L	11/09/15 11:40	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: RADC/26522 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 970745 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0227 ± 0.561 (0.972) C:NA T:92%	pCi/L	11/06/15 10:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

QC Batch: RADC/26588 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92272155001, 92272155002, 92272155003

METHOD BLANK: 973255 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.487 ± 0.362 (0.707) C:82% T:87%	pCi/L	11/04/15 13:00	

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QUALIFIERS

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BRICKHAVEN - CHARRAH
Pace Project No.: 92272155

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272155001	**MW-5**	EPA 300.0	GWD/2594		
92272155002	**MW-8**	EPA 300.0	GWD/2594		
92272155003	**MW-5 DUP**	EPA 300.0	GWD/2594		
92272155001	**MW-5**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272155002	**MW-8**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272155003	**MW-5 DUP**	EPA 200.7	MPRP/27013	EPA 200.7	ICP/16281
92272155001	**MW-5**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272155002	**MW-8**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272155003	**MW-5 DUP**	EPA 3010	MPRP/19840	EPA 6010	ICP/17891
92272155001	**MW-5**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272155002	**MW-8**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272155003	**MW-5 DUP**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272155001	**MW-5**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272155002	**MW-8**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272155003	**MW-5 DUP**	EPA 7470	MERP/8557	EPA 7470	MERC/8218
92272155001	**MW-5**	EPA 8260	MSV/33856		
92272155002	**MW-8**	EPA 8260	MSV/33856		
92272155003	**MW-5 DUP**	EPA 8260	MSV/33856		
92272155001	**MW-5**	EPA 903.1	RADC/26522		
92272155002	**MW-8**	EPA 903.1	RADC/26522		
92272155003	**MW-5 DUP**	EPA 903.1	RADC/26522		
92272155001	**MW-5**	EPA 904.0	RADC/26588		
92272155002	**MW-8**	EPA 904.0	RADC/26588		
92272155003	**MW-5 DUP**	EPA 904.0	RADC/26588		
92272155001	**MW-5**	Total Radium Calculation	RADC/26787		
92272155002	**MW-8**	Total Radium Calculation	RADC/26787		
92272155003	**MW-5 DUP**	Total Radium Calculation	RADC/26787		
92272155001	**MW-5**	SM 2540C	WET/40905		
92272155002	**MW-8**	SM 2540C	WET/40905		
92272155003	**MW-5 DUP**	SM 2540C	WET/40905		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 16, 2016 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USP ☐ Client ☐ Commercial ☐ Pace Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1402 **Type of Ice:** Wet Blue None ☐ Samples on ice, cooling process has begun

Temp Correction Factor **T1402** No Correction

Corrected Cooler Temp.: 5.9 °C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10/16

		Comments:
Chain of Custody Present:	☐Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☐Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☐Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☐No ☐N/A	7.
Sufficient Volume:	☐Yes ☐No ☐N/A	8.
Correct Containers Used:	☐Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☐No ☐N/A	
Containers Intact:	☐Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☐N/A	11.
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix:_____		
All containers needing preservation have been checked.	☐Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☐Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☐N/A	15.
Trip Blank Present:	☐Yes ☐No ☐N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:	JY	**Date:**	10/16/15
SRF Review:	JY	**Date:**	10/16/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Place label here

WO# : 92272155

92272155

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2001617

Section A
Required Client Information:

Company: HDR	
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name: Brickhaven - Charrah	
Project Number:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location
STATE: NC

Section D
Required Client Information

Matrix Codes
MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226	Metals	Chloride/Sulfate	TDS	Fluoride	VOC							Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92272155
1	MW-5		G			10/15/15	1320		11	3		5	3					3	2	1	1	1	3							001
2	MW-8		G			10/15/15	1640		11	3		5	3					3	2	1	1	1	3							002
3	MW-5 Dup		G			10/15/15	1325		11	3		5	3					3	2	1	1	1	3							003
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Elijah Jarred Wittum	10/15/15	2100	[signature] HDR	10.15.15	2100	29	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Elijah Jarred Wittum

SIGNATURE of SAMPLER: Elijah Jarred Wittum — DATE Signed (MM/DD/YY): 10/15/15

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of 2
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Charrah / HDR Location: Mebane, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): EJW/JDH - Pace Analytical

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW-8 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 49.66 ft Multi Factor*: 0.163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 35.89 ft Casing Volume: 2.24 gallons

Height of Water Column: 13.77 ft Cal. 3 Volumes: 6.73 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: 1435 Finish: 1635 Purge Rate: 100 mL per min

Purging Method: Variable Speed Mega Monsoon Total Volume Purged: 12 gallons

Sampling Information

Date Collected: 10/15/15 Time Collected: 1640 am pm

Sampling Equipment Used: Variable Speed Mega Monsoon

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 19.7 Time: 1635 Turbidity (ntu): 4.4 Time: 1635

Sample pH (s.u.): 7.0 Time: 1635 Diss Oxy (mg/L): 0.83 Time: 1635

Specific Cond. (uS): 2004 Time: 1635 Res. Cl (mg/L): — Time: —

ReDox (mV): 161.2 Time: 1635 Other: Fe^{2+} = 0.5 Time: 1635

Odor: None Time: 1635 Appearance: Clear

General/Weather Observations

Sunny, temps 70s,

Sampler Signature/Date: Elyah Jarrod Witt 10/15/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (L)	Other
1440	6.8	3806	191.6	270.4	4.63	20.6	0.5	
1445	6.8	3804	195.8	209.4	3.73	20.7	1.0	
1450	6.8	3630	195.3	138.4	3.29	22.6	1.5	
1455	6.9	3540	199.1	93.6	3.15	22.5	2.0	
1500	6.9	3373	200.1	77.2	2.78	22.5	2.5	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: Charrah

Location: Mebane, NC

Project: Brickshaven,

Well ID: MW-8

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (L)	Other
1510	6.9	3052	199.5	40.8	2.40	21.0	3.5	
1520	6.9	2836	187.5	30.1	2.07	20.4	4.5	
1530	7.0	2545	178.4	22.9	1.63	20.6	5.5	
1540	7.0	2301	168.9	11.2	1.32	21.5	6.5	
1550	7.0	2212	163.7	8.5	1.16	21.3	7.5	
1600	7.0	2183	164.7	8.7	1.15	20.4	8.5	
1610	7.0	2153	164.5	8.0	1.04	20.2	9.5	
1620	7.0	2056	162.1	5.7	0.94	20.5	10.5	
1630	7.0	2017	162.0	3.7	0.87	20.1	11.0	
1635	7.0	2004	161.2	4.4	0.83	19.7	12.0	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of 2
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Charrah / HDR Location: Mebane, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): EJW/JDH - Pace Analytical

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW-5 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 46.92 ft Multi Factor*: 0.163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 15.20 ft Casing Volume: 5.17 gallons

Height of Water Column: 31.72 ft Cal. 3 Volumes: 15.51 gallons

Purge Information

Date Purged: 10 / 15 / 15 Start Time: 1125 Finish: 1315 Purge Rate: 100 mL per min

Purging Method: Variable Speed Mega Monsoon Total Volume Purged: 4 gallons

Sampling Information

Date Collected: 10/15/15 Time Collected: 1320 am (pm)

Sampling Equipment Used: Variable Speed Mega Monsoon

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 20.6 Time: 1315 Turbidity (ntu): 9.4 Time: 1315

Sample pH (s.u.): 7.3 Time: 1315 Diss Oxy (mg/L): 0.81 Time: 1315

Specific Cond. (uS): 483.1 Time: 1315 Res. Cl (mg/L): — Time: —

ReDox (mV): 166.0 Time: 1315 Other: Fe2+ = ND Time: 1315

Odor: None Time: 1315 Appearance: Clear

General/Weather Observations

Sunny, temps 70s, heavy traffic area, Duplicated MW-5 @ 1325

Sampler Signature/Date: Elijah Jarrod Witt

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (L)	Other
1130	7.2	477.5	172.2	237.8	2.84	19.3	0.5	
1135	7.2	477.0	181.6	140.2	2.92	19.6	1.0	
1140	7.2	476.5	177.9	60.8	1.59	18.2	1.5	
1145	7.2	471.6	177.6	31.3	1.49	18.7	2.0	
1150	7.2	473.4	176.9	34.3	1.51	19.3	2.5	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: Cherrah

Location: Mebane, NC

Project: Brickhaven

Well ID: MW-5

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (L)	Other
1155	7.2	468.3	178.0	22.5	1.35	20.3	3.0	
1200	7.2	475.9	177.9	30.7	1.27	19.5	3.5	
1205	7.2	477.0	177.9	19.4	1.27	19.5	4.0	
1210	7.2	479.2	177.8	20.5	1.23	19.3	4.5	
1220	7.2	479.0	177.8	22.8	1.18	19.8	5.5	
1230	7.3	478.9	175.9	20.3	1.11	19.9	6.5	
1240	7.3	478.3	173.4	14.0	1.03	20.4	7.5	
1250	7.3	481.9	171.6	15.5	0.98	20.1	8.5	
1300	7.3	483.4	169.4	10.9	0.89	20.4	9.5	
1310	7.3	482.0	166.7	9.4	0.82	20.6	10.5	

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 04, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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Huntersville, NC 28078
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SAMPLE SUMMARY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92272367001	**MW-7**	Water	10/16/15 10:34	10/17/15 12:46

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SAMPLE ANALYTE COUNT

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92272367001	**MW-7**	EPA 300.0	CDC	3	PASI-G
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A

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Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272367001	**MW-7**					
EPA 300.0	Chloride	422	mg/L	9.0	10/21/15 22:54	
EPA 300.0	Fluoride	0.38	mg/L	0.10	10/21/15 17:54	
EPA 300.0	Sulfate	46.9	mg/L	1.0	10/21/15 17:54	
EPA 6010	Antimony	5.9	ug/L	5.0	10/21/15 18:32	
EPA 6010	Barium	237	ug/L	5.0	10/21/15 18:32	
EPA 6010	Calcium	34200	ug/L	100	10/21/15 18:32	M1
EPA 6010	Chromium	10.7	ug/L	5.0	10/21/15 18:32	
EPA 6010	Nickel	8.7	ug/L	5.0	10/21/15 18:32	
EPA 6010	Zinc	18.6	ug/L	10.0	10/21/15 18:32	
EPA 6020A	Boron	53.1	ug/L	5.0	10/27/15 14:04	M1
EPA 6020A	Lithium	23.5	ug/L	0.50	10/27/15 14:04	
EPA 903.1	Radium-226	0.464 ± 0.485 (0.683) C:NA T:84%	pCi/L		11/02/15 14:31	
EPA 904.0	Radium-228	0.273 ± 0.351 (0.746) C:80% T:84%	pCi/L		11/02/15 19:21	
Total Radium Calculation	Total Radium	0.737 ± 0.836 (1.43)	pCi/L		11/03/15 17:02	
SM 2540C	Total Dissolved Solids	890	mg/L	250	10/20/15 10:47	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Sample: MW-7 **Lab ID: 92272367001** Collected: 10/16/15 10:34 Received: 10/17/15 12:46 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**422**	mg/L	9.0	9		10/21/15 22:54	16887-00-6	
Fluoride	**0.38**	mg/L	0.10	1		10/21/15 17:54	16984-48-8	
Sulfate	**46.9**	mg/L	1.0	1		10/21/15 17:54	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	**5.9**	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/20/15 18:00	10/21/15 18:32	7440-38-2	
Barium	**237**	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/20/15 18:00	10/21/15 18:32	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/20/15 18:00	10/21/15 18:32	7440-43-9	
Calcium	**34200**	ug/L	100	1	10/20/15 18:00	10/21/15 18:32	7440-70-2	M1
Chromium	**10.7**	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-48-4	
Copper	ND	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-50-8	
Lead	ND	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7439-98-7	
Nickel	**8.7**	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/20/15 18:00	10/21/15 18:32	7782-49-2	
Silver	ND	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/20/15 18:00	10/21/15 18:32	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/20/15 18:00	10/21/15 18:32	7440-62-2	
Zinc	**18.6**	ug/L	10.0	1	10/20/15 18:00	10/21/15 18:32	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**53.1**	ug/L	5.0	1	10/27/15 10:30	10/27/15 14:04	7440-42-8	M1
Lithium	**23.5**	ug/L	0.50	1	10/27/15 10:30	10/27/15 14:04	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/20/15 15:30	10/22/15 12:10	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/22/15 19:14	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/22/15 19:14	107-13-1	
Benzene	ND	ug/L	1.0	1		10/22/15 19:14	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/22/15 19:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/22/15 19:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/22/15 19:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/22/15 19:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/22/15 19:14	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/22/15 19:14	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/22/15 19:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/22/15 19:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/22/15 19:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/22/15 19:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/22/15 19:14	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/22/15 19:14	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Sample: MW-7 **Lab ID: 92272367001** Collected: 10/16/15 10:34 Received: 10/17/15 12:46 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/22/15 19:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/22/15 19:14	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/22/15 19:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/22/15 19:14	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/22/15 19:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/22/15 19:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/22/15 19:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/22/15 19:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/22/15 19:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/22/15 19:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/22/15 19:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/22/15 19:14	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/22/15 19:14	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/22/15 19:14	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/22/15 19:14	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/22/15 19:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/22/15 19:14	108-10-1	
Styrene	ND	ug/L	1.0	1		10/22/15 19:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/22/15 19:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/22/15 19:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/22/15 19:14	127-18-4	
Toluene	ND	ug/L	1.0	1		10/22/15 19:14	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/22/15 19:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/22/15 19:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/22/15 19:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/22/15 19:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/22/15 19:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/22/15 19:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/22/15 19:14	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/22/15 19:14	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		10/22/15 19:14	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		10/22/15 19:14	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/22/15 19:14	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**890**	mg/L	250	1		10/20/15 10:47		

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: GWD/2594
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92272367001

METHOD BLANK: 1587393
Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/21/15 10:39	
Fluoride	mg/L	ND	0.10	10/21/15 10:39	
Sulfate	mg/L	ND	1.0	10/21/15 10:39	

LABORATORY CONTROL SAMPLE: 1587394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.1	98	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	50	47.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587395 1587396

Parameter	Units	92272154001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	10.2	50	50	59.9	60.1	99	100	90-110	0	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	93	95	90-110	2	20	
Sulfate	mg/L	28.1	50	50	77.1	77.3	98	98	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587397 1587398

Parameter	Units	92272483001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16.4	50	50	66.1	65.9	99	99	90-110	0	20	
Fluoride	mg/L	0.67	2.5	2.5	3.1	3.1	99	98	90-110	1	20	
Sulfate	mg/L	24.2	50	50	73.0	72.7	98	97	90-110	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: MERP/8560
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Associated Lab Samples: 92272367001

METHOD BLANK: 1586302
Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/22/15 11:49	

LABORATORY CONTROL SAMPLE: 1586303

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586304 1586305

Parameter	Units	92272254007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.10	2.5	2.5	2.4	2.5	98	99	75-125	1	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: MPRP/19848
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92272367001

METHOD BLANK: 1587071
Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	10/21/15 18:26	
Arsenic	ug/L	ND	10.0	10/21/15 18:26	
Barium	ug/L	ND	5.0	10/21/15 18:26	
Beryllium	ug/L	ND	1.0	10/21/15 18:26	
Cadmium	ug/L	ND	1.0	10/21/15 18:26	
Calcium	ug/L	ND	100	10/21/15 18:26	
Chromium	ug/L	ND	5.0	10/21/15 18:26	
Cobalt	ug/L	ND	5.0	10/21/15 18:26	
Copper	ug/L	ND	5.0	10/21/15 18:26	
Lead	ug/L	ND	5.0	10/21/15 18:26	
Molybdenum	ug/L	ND	5.0	10/21/15 18:26	
Nickel	ug/L	ND	5.0	10/21/15 18:26	
Selenium	ug/L	ND	10.0	10/21/15 18:26	
Silver	ug/L	ND	5.0	10/21/15 18:26	
Thallium	ug/L	ND	5.4	10/21/15 18:26	
Vanadium	ug/L	ND	5.0	10/21/15 18:26	
Zinc	ug/L	ND	10.0	10/21/15 18:26	

LABORATORY CONTROL SAMPLE: 1587072

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	507	101	80-120	
Arsenic	ug/L	500	489	98	80-120	
Barium	ug/L	500	514	103	80-120	
Beryllium	ug/L	500	512	102	80-120	
Cadmium	ug/L	500	503	101	80-120	
Calcium	ug/L	5000	4870	97	80-120	
Chromium	ug/L	500	498	100	80-120	
Cobalt	ug/L	500	500	100	80-120	
Copper	ug/L	500	501	100	80-120	
Lead	ug/L	500	496	99	80-120	
Molybdenum	ug/L	500	534	107	80-120	
Nickel	ug/L	500	502	100	80-120	
Selenium	ug/L	500	486	97	80-120	
Silver	ug/L	250	239	96	80-120	
Thallium	ug/L	500	494	99	80-120	
Vanadium	ug/L	500	506	101	80-120	
Zinc	ug/L	500	491	98	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587073 1587074

Parameter	Units	92272367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	5.9	500	500	447	450	88	89	75-125	1	25	
Arsenic	ug/L	ND	500	500	441	443	88	89	75-125	0	25	
Barium	ug/L	237	500	500	682	682	89	89	75-125	0	25	
Beryllium	ug/L	ND	500	500	451	454	90	91	75-125	1	25	
Cadmium	ug/L	ND	500	500	439	442	88	88	75-125	1	25	
Calcium	ug/L	34200	5000	5000	38000	37800	78	73	75-125	1	25	M1
Chromium	ug/L	10.7	500	500	446	447	87	87	75-125	0	25	
Cobalt	ug/L	ND	500	500	419	420	84	84	75-125	0	25	
Copper	ug/L	ND	500	500	445	450	89	90	75-125	1	25	
Lead	ug/L	ND	500	500	405	409	81	81	75-125	1	25	
Molybdenum	ug/L	ND	500	500	467	469	93	93	75-125	0	25	
Nickel	ug/L	8.7	500	500	427	428	84	84	75-125	0	25	
Selenium	ug/L	ND	500	500	429	430	86	86	75-125	0	25	
Silver	ug/L	ND	250	250	213	215	85	86	75-125	1	25	
Thallium	ug/L	ND	500	500	380	378	76	76	75-125	0	25	
Vanadium	ug/L	ND	500	500	454	459	90	91	75-125	1	25	
Zinc	ug/L	18.6	500	500	443	444	85	85	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: MPRP/59095
QC Batch Method: EPA 3020
Analysis Method: EPA 6020A
Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92272367001

METHOD BLANK: 2118485
Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	10/27/15 13:46	
Lithium	ug/L	ND	0.50	10/27/15 13:46	

LABORATORY CONTROL SAMPLE: 2118486

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	80.2	100	80-120	
Lithium	ug/L	80	85.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2118487 2118488

Parameter	Units	92272367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	53.1	80	80	161	158	135	132	75-125	2	20	M1
Lithium	ug/L	23.5	80	80	110	107	108	105	75-125	3	20	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: MSV/33919
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92272367001

METHOD BLANK: 1588822
Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1-Dichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1-Dichloroethene	ug/L	ND	1.0	10/22/15 18:57	
1,2,3-Trichloropropane	ug/L	ND	1.0	10/22/15 18:57	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/22/15 18:57	
1,2-Dichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,2-Dichloropropane	ug/L	ND	1.0	10/22/15 18:57	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/22/15 18:57	
2-Butanone (MEK)	ug/L	ND	5.0	10/22/15 18:57	
2-Hexanone	ug/L	ND	5.0	10/22/15 18:57	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/22/15 18:57	
Acetone	ug/L	ND	25.0	10/22/15 18:57	
Acrylonitrile	ug/L	ND	10.0	10/22/15 18:57	
Benzene	ug/L	ND	1.0	10/22/15 18:57	
Bromochloromethane	ug/L	ND	1.0	10/22/15 18:57	
Bromodichloromethane	ug/L	ND	1.0	10/22/15 18:57	
Bromoform	ug/L	ND	1.0	10/22/15 18:57	
Bromomethane	ug/L	ND	2.0	10/22/15 18:57	
Carbon disulfide	ug/L	ND	2.0	10/22/15 18:57	
Carbon tetrachloride	ug/L	ND	1.0	10/22/15 18:57	
Chlorobenzene	ug/L	ND	1.0	10/22/15 18:57	
Chloroethane	ug/L	ND	1.0	10/22/15 18:57	
Chloroform	ug/L	ND	1.0	10/22/15 18:57	
Chloromethane	ug/L	ND	1.0	10/22/15 18:57	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/22/15 18:57	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/22/15 18:57	
Dibromochloromethane	ug/L	ND	1.0	10/22/15 18:57	
Dibromomethane	ug/L	ND	1.0	10/22/15 18:57	
Ethylbenzene	ug/L	ND	1.0	10/22/15 18:57	
Iodomethane	ug/L	ND	5.0	10/22/15 18:57	
Methylene Chloride	ug/L	ND	1.0	10/22/15 18:57	
Styrene	ug/L	ND	1.0	10/22/15 18:57	
Tetrachloroethene	ug/L	ND	1.0	10/22/15 18:57	
Toluene	ug/L	ND	1.0	10/22/15 18:57	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/22/15 18:57	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/22/15 18:57	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	10/22/15 18:57	
Trichloroethene	ug/L	ND	1.0	10/22/15 18:57	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

METHOD BLANK: 1588822 Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	10/22/15 18:57	
Vinyl acetate	ug/L	ND	2.0	10/22/15 18:57	
Vinyl chloride	ug/L	ND	1.0	10/22/15 18:57	
Xylene (Total)	ug/L	ND	2.0	10/22/15 18:57	
1,2-Dichloroethane-d4 (S)	%	96	70-130	10/22/15 18:57	
4-Bromofluorobenzene (S)	%	102	70-130	10/22/15 18:57	
Toluene-d8 (S)	%	100	70-130	10/22/15 18:57	

LABORATORY CONTROL SAMPLE: 1588823

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	47.0	94	80-125	
1,1,1-Trichloroethane	ug/L	50	52.4	105	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	50.1	100	79-124	
1,1,2-Trichloroethane	ug/L	50	48.2	96	85-125	
1,1-Dichloroethane	ug/L	50	50.1	100	73-126	
1,1-Dichloroethene	ug/L	50	53.3	107	66-135	
1,2,3-Trichloropropane	ug/L	50	47.6	95	75-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	80-133	
1,2-Dichloroethane	ug/L	50	44.5	89	67-128	
1,2-Dichloropropane	ug/L	50	48.9	98	75-132	
1,4-Dichlorobenzene	ug/L	50	50.6	101	78-130	
2-Butanone (MEK)	ug/L	100	95.0	95	61-144	
2-Hexanone	ug/L	100	100	100	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.6	100	72-135	
Acetone	ug/L	100	101	101	48-146	
Acrylonitrile	ug/L	250	242	97	40-160	
Benzene	ug/L	50	50.0	100	80-125	
Bromochloromethane	ug/L	50	52.3	105	71-125	
Bromodichloromethane	ug/L	50	53.9	108	78-124	
Bromoform	ug/L	50	42.0	84	71-128	
Bromomethane	ug/L	50	51.8	104	40-160	
Carbon disulfide	ug/L	50	56.9	114	50-160	
Carbon tetrachloride	ug/L	50	47.7	95	69-131	
Chlorobenzene	ug/L	50	49.6	99	81-122	
Chloroethane	ug/L	50	45.1	90	39-148	
Chloroform	ug/L	50	50.9	102	73-127	
Chloromethane	ug/L	50	48.2	96	44-146	
cis-1,2-Dichloroethene	ug/L	50	48.5	97	74-124	
cis-1,3-Dichloropropene	ug/L	50	52.9	106	72-132	
Dibromochloromethane	ug/L	50	47.0	94	78-125	
Dibromomethane	ug/L	50	50.6	101	82-120	
Ethylbenzene	ug/L	50	49.6	99	79-121	
Iodomethane	ug/L	100	110	110	39-154	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

LABORATORY CONTROL SAMPLE: 1588823

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	48.6	97	64-133	
Styrene	ug/L	50	51.0	102	84-126	
Tetrachloroethene	ug/L	50	51.2	102	78-122	
Toluene	ug/L	50	48.8	98	80-121	
trans-1,2-Dichloroethene	ug/L	50	49.6	99	71-127	
trans-1,3-Dichloropropene	ug/L	50	47.5	95	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	51.6	103	40-160	
Trichloroethene	ug/L	50	48.3	97	78-122	
Trichlorofluoromethane	ug/L	50	46.9	94	53-137	
Vinyl acetate	ug/L	100	99.2	99	40-160	
Vinyl chloride	ug/L	50	57.7	115	58-137	
Xylene (Total)	ug/L	150	150	100	81-126	
1,2-Dichloroethane-d4 (S)	%			95	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1588824 1588825

Parameter	Units	92272094005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	17.2	20.2	86	101	70-130	16	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.5	24.9	112	124	70-130	10	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	19.2	21.4	96	107	70-130	11	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	20.4	21.2	102	106	70-130	4	30	
1,1-Dichloroethane	ug/L	ND	20	20	21.1	23.2	106	116	70-130	9	30	
1,1-Dichloroethene	ug/L	ND	20	20	25.0	24.9	125	124	70-166	0	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	20.3	21.1	102	106	70-130	4	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	20.5	21.5	102	107	70-130	5	30	
1,2-Dichloroethane	ug/L	ND	20	20	20.5	21.3	102	106	70-130	4	30	
1,2-Dichloropropane	ug/L	ND	20	20	20.8	21.7	104	108	70-130	4	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	21.2	21.6	106	108	70-130	2	30	
2-Butanone (MEK)	ug/L	ND	40	40	40.9	44.7	102	112	70-130	9	30	
2-Hexanone	ug/L	ND	40	40	45.6	45.5	114	114	70-130	0	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	45.7	45.0	114	113	70-130	2	30	
Acetone	ug/L	ND	40	40	40.8	50.5	102	126	70-130	21	30	
Acrylonitrile	ug/L	ND	100	100	98.1	113	98	113	70-130	14	30	
Benzene	ug/L	ND	20	20	21.5	22.5	107	113	70-148	5	30	
Bromochloromethane	ug/L	ND	20	20	20.4	22.3	102	112	70-130	9	30	
Bromodichloromethane	ug/L	ND	20	20	20.1	22.0	101	110	70-130	9	30	
Bromoform	ug/L	ND	20	20	14.9	17.7	75	89	70-130	17	30	
Bromomethane	ug/L	ND	20	20	30.1	25.0	151	125	70-130	19	30	M1
Carbon disulfide	ug/L	ND	20	20	22.9	22.9	114	114	70-130	0	30	
Carbon tetrachloride	ug/L	ND	20	20	20.8	22.3	104	112	70-130	7	30	
Chlorobenzene	ug/L	ND	20	20	20.8	21.6	104	108	70-146	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1588824 1588825

Parameter	Units	92272094005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloroethane	ug/L	ND	20	20	21.5	20.5	107	103	70-130	4	30	
Chloroform	ug/L	ND	20	20	21.6	23.2	108	116	70-130	7	30	
Chloromethane	ug/L	ND	20	20	22.9	23.4	114	117	70-130	2	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	20.1	22.2	100	111	70-130	10	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	18.5	20.3	92	102	70-130	10	30	
Dibromochloromethane	ug/L	ND	20	20	15.6	18.9	78	95	70-130	19	30	
Dibromomethane	ug/L	ND	20	20	20.8	21.3	104	106	70-130	3	30	
Ethylbenzene	ug/L	ND	20	20	21.1	22.3	106	111	70-130	5	30	
Iodomethane	ug/L	0.87J	40	40	42.1	41.3	103	101	70-130	2	30	
Methylene Chloride	ug/L	ND	20	20	19.0	22.7	95	113	70-130	18	30	
Styrene	ug/L	ND	20	20	20.7	21.8	103	109	70-130	6	30	
Tetrachloroethene	ug/L	ND	20	20	22.1	22.7	111	113	70-130	2	30	
Toluene	ug/L	ND	20	20	21.6	21.8	107	108	70-155	1	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	20.6	23.0	103	115	70-130	11	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	17.5	19.4	87	97	70-130	10	30	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	20	17.2	19.6	86	98	70-130	13	30	
Trichloroethene	ug/L	ND	20	20	21.1	22.1	105	110	69-151	5	30	
Trichlorofluoromethane	ug/L	ND	20	20	24.0	24.6	120	123	70-130	2	30	
Vinyl acetate	ug/L	ND	40	40	32.3	36.0	81	90	70-130	11	30	
Vinyl chloride	ug/L	ND	20	20	25.6	25.6	128	128	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						105	105	70-130			
4-Bromofluorobenzene (S)	%						100	103	70-130			
Toluene-d8 (S)	%						102	99	70-130			

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: WET/40923
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92272367001

METHOD BLANK: 1586399
Matrix: Water
Associated Lab Samples: 92272367001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	10/20/15 10:44	

LABORATORY CONTROL SAMPLE: 1586400

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	252	101	90-110	

SAMPLE DUPLICATE: 1586401

Parameter	Units	92272334001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	109	130	18	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Sample: MW-7 **Lab ID: 92272367001** Collected: 10/16/15 10:34 Received: 10/17/15 12:46 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.464 ± 0.485 (0.683) C:NA T:84%**	pCi/L	11/02/15 14:31	13982-63-3	
Radium-228	EPA 904.0	**0.273 ± 0.351 (0.746) C:80% T:84%**	pCi/L	11/02/15 19:21	15262-20-1	
Total Radium	Total Radium Calculation	**0.737 ± 0.836 (1.43)**	pCi/L	11/03/15 17:02	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: RADC/26599 | Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 | Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92272367001

METHOD BLANK: 974294 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.264 ± 0.402 (0.647) C:NA T:93%	pCi/L	11/02/15 13:07	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

QC Batch: RADC/26585 | Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 | Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92272367001

METHOD BLANK: 973252 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.440 ± 0.374 (0.753) C:78% T:84%	pCi/L	11/02/15 19:20	

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QUALIFIERS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92272367

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272367001	**MW-7**	EPA 300.0	GWD/2594		
92272367001	**MW-7**	EPA 3010	MPRP/19848	EPA 6010	ICP/17901
92272367001	**MW-7**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272367001	**MW-7**	EPA 7470	MERP/8560	EPA 7470	MERC/8226
92272367001	**MW-7**	EPA 8260	MSV/33919		
92272367001	**MW-7**	EPA 903.1	RADC/26599		
92272367001	**MW-7**	EPA 904.0	RADC/26585		
92272367001	**MW-7**	Total Radium Calculation	RADC/26691		
92272367001	**MW-7**	SM 2540C	WET/40923		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 16, 2016 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USP ☐ Client ☐ Commercial ☐ Pace Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1402 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

Temp Correction Factor **T1402** No Correction

Corrected Cooler Temp.: 0.0 °C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: AP 10-19-15

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: JD **Date:** 10/19/15

SRF Review: JD **Date:** 10/20/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92272367

92272367

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1821677

Section A Required Client Information:

Company: HDR	
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	
Copy To:	
Purchase Order No.:	
Project Name:	Charrah - Brickhaven
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N) Radium 226	Metals	TDS	Chloride/Sulfate	Fluoride	Halo x3 VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92272367
1	MW-7		G			10/16/15	1034		11									3	2	1	1	1	3		001
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	10/16/15	1630	[illegible] PACE	10-17-15	1246				
	[illegible] PACE	10-17-15	1422	[illegible]	10-19-15	1442	0.6	✓	✓	✓

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 10/16/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charrah - Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 17.65 ft Multi Factor*: 0.630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 9.35 ft Casing Volume: 1.3529 gallons

Height of Water Column: 8.3 ft Cal. 3 Volumes: 4.0587 gallons

Purge Information

Date Purged: 10/16/15 Start Time: 1005 Finish: 1034 Purge Rate: 100 mL/min

Purging Method: ~~Peristaltic~~ CS 10/16/15 Monsoon Total Volume Purged: 2500 ~~gallons~~ mL

Sampling Information

Date Collected: 10/16/15 Time Collected: 1034 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium x3, metals x2, TDS, Chloride/Sulfate, Fluoride, VOC x3

Field Measurements/Observations

Sample Temp (°C): 18.9 Time: 1034 Turbidity (ntu): 2.41 Time: 1034

Sample pH (s.u.): 6.62 Time: Diss Oxy (mg/L): 6.90 Time: 1034

Specific Cond. (uS): 1856 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 60.8 Time: Other: Iron: 0.0 mg/L Time: 1034

Odor: None Time: Appearance: Clear

General/Weather Observations

Low recharge well. Cloudy, cool, 65°F. Construction near by

Sampler Signature/Date: [signature] / 10/16/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level
1014	6.53	1883	60.3	4.40	7.71	20.0	500mL	12.55ft
1019	6.61	1854	55.8	2.51	7.13	19.8	1000mL	13.25ft
1024	6.62	1858	62.5	2.40	6.92	19.2	1500mL	13.26ft
1029	6.62	1852	67.8	2.35	6.87	18.8	2000mL	13.26ft
1034	6.62	1856	60.8	2.41	6.90	18.9	2500mL	13.26ft

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cherrah-Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A / PAE

Name and Afiliation (Inspector): ____

Well Information

Well ID: MW-6 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 28.90 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 7.11 ft Casing Volume: 3.55177 gallons

Height of Water Column: 21.79 ft Cal. 3 Volumes: 10.65531 gallons

Purge Information

Date Purged: 10/16/15 Start Time: 1250 Finish: 1510 Purge Rate: 500 mL/min

Purging Method: CB 10/16/15 Plastic Submersible ~~Man Soon~~ Total Volume Purged: 17.17 gallons (65000 mL)

Sampling Information

Date Collected: ____ Time Collected: ____ am pm

Sampling Equipment Used: ____

Bottle Type	Preservation	Analysis Required
		~~Radium 226 x3~~ CB 10/16/15
		~~metals x2, TDS~~, CB
		~~Chloride/Sulfate~~, CB
		~~Fluoride, VOC x3~~ CB

Field Measurements/Observations

Sample Temp (°C): ____ Time: ____ Turbidity (ntu): ____ Time: ____

Sample pH (s.u.): ____ Time: ____ Diss Oxy (mg/L): ____ Time: ____

Specific Cond. (uS): ____ Time: ____ Res. Cl (mg/L): — Time: —

ReDox (mV): ____ Time: ____ Other: ____ Time: ____

Odor: ____ Time: ____ Appearance: Muddy → Cloudy → Clear

General/Weather Observations

Well Damaged. Re-Developing well. Down bank. Run tube/pump down hill

Sampler Signature/Date: [signature] /10/16/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
1300	7.36	1186	99.2	596.1	1.02	19.5	5000 mL	14 ft
1310	6.66	1117	50.8	124.1	0.55	18.8	10000 mL	14 ft
1320	6.37	1044	44.9	24.38	0.36	18.9	15000 mL	13.6
1330	6.32	1051	42.2	32.99	0.36	18.8	20000 mL	12.15
1340	6.34	1170	46.8	42.76	0.61	18.6	25000 mL	~~11.7~~ 11.57 CB 10/16/15

Pace Analytical	Document Name: Field Data Sheet	Document issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Mooresville, NC

Project: Chevron - Brickhaven

Well ID: MW-6

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
1350	6.25	1026	42.3	11.72	0.26	19.1	3000 mL ~~2500 mL~~	water level: 11.90 ft
1400	6.24	1034	44.6	10.34	0.25	19.2	3500 mL	11.12 ft
1405	6.25	1044	45.0	15.25	0.26	19.2	3750 mL	11.12 ft
1415	6.26	1062	45.6	50.31	0.28	18.9	4250 mL	11.20 ft
1425	6.23	1026	42.0	23.45	0.19	18.7	4750 mL	11.64 ft
1435	6.23	1070	44.5	18.53	0.34	18.2	5250 mL	12.00 ft
1445	6.23	1054	43.8	14.65	0.22	18.9	5500 mL	11.18 ft
1450	6.23	1054	44.3	16.47	0.22	18.8	6250 mL	10.93
1500 ~~1455~~	6.23	1065	45.8	12.61	0.21	18.9	6000 mL	12.00
1505	6.22	1047	44.1	10.25	0.20	19.0	6250 mL	12.01
1510	6.22	1050	43.5	9.32	0.19	19.0	6500 mL	11.56

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 06, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on October 20, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92272498001	**MW-6**	Water	10/19/15 10:52	10/20/15 10:01

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SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92272498001	**MW-6**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	SAM	1	PASI-A

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SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92272498001	**MW-6**					
EPA 300.0	Chloride	241	mg/L	5.0	10/22/15 18:57	
EPA 300.0	Fluoride	0.45	mg/L	0.10	10/22/15 13:14	
EPA 300.0	Sulfate	66.1	mg/L	1.0	10/22/15 13:14	
EPA 6010	Antimony	5.6	ug/L	5.0	10/28/15 16:04	
EPA 6010	Barium	117	ug/L	5.0	10/28/15 16:04	
EPA 6010	Calcium	38100	ug/L	100	10/28/15 16:04	M1
EPA 6010	Zinc	11.5	ug/L	10.0	10/28/15 16:04	
EPA 6020A	Boron	6.7	ug/L	5.0	10/27/15 21:09	
EPA 6020A	Lithium	43.1	ug/L	0.50	10/27/15 21:09	
EPA 903.1	Radium-226	0.172 ± 0.393 (0.634) C:NA T:94%	pCi/L		11/02/15 14:17	
EPA 904.0	Radium-228	0.395 ± 0.347 (0.699) C:80% T:84%	pCi/L		11/02/15 19:21	
Total Radium Calculation	Total Radium	0.567 ± 0.740 (1.33)	pCi/L		11/03/15 17:02	
SM 2540C	Total Dissolved Solids	620	mg/L	250	10/21/15 09:09	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Sample: MW-6 **Lab ID: 92272498001** Collected: 10/19/15 10:52 Received: 10/20/15 10:01 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**241**	mg/L	5.0	5		10/22/15 18:57	16887-00-6	
Fluoride	**0.45**	mg/L	0.10	1		10/22/15 13:14	16984-48-8	
Sulfate	**66.1**	mg/L	1.0	1		10/22/15 13:14	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	**5.6**	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-36-0	
Arsenic	ND	ug/L	10.0	1	10/28/15 10:30	10/28/15 16:04	7440-38-2	
Barium	**117**	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/28/15 10:30	10/28/15 16:04	7440-41-7	
Cadmium	ND	ug/L	1.0	1	10/28/15 10:30	10/28/15 16:04	7440-43-9	
Calcium	**38100**	ug/L	100	1	10/28/15 10:30	10/28/15 16:04	7440-70-2	M1
Chromium	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-47-3	
Cobalt	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-48-4	
Copper	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-50-8	
Lead	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7439-98-7	
Nickel	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-02-0	
Selenium	ND	ug/L	10.0	1	10/28/15 10:30	10/28/15 16:04	7782-49-2	
Silver	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-22-4	
Thallium	ND	ug/L	5.4	1	10/28/15 10:30	10/28/15 16:04	7440-28-0	
Vanadium	ND	ug/L	5.0	1	10/28/15 10:30	10/28/15 16:04	7440-62-2	
Zinc	**11.5**	ug/L	10.0	1	10/28/15 10:30	10/28/15 16:04	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**6.7**	ug/L	5.0	1	10/27/15 10:30	10/27/15 21:09	7440-42-8	
Lithium	**43.1**	ug/L	0.50	1	10/27/15 10:30	10/27/15 21:09	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	10/21/15 15:00	10/26/15 13:03	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		10/22/15 19:31	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		10/22/15 19:31	107-13-1	
Benzene	ND	ug/L	1.0	1		10/22/15 19:31	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		10/22/15 19:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		10/22/15 19:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		10/22/15 19:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		10/22/15 19:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		10/22/15 19:31	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		10/22/15 19:31	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		10/22/15 19:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		10/22/15 19:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		10/22/15 19:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		10/22/15 19:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		10/22/15 19:31	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		10/22/15 19:31	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Sample: MW-6 **Lab ID: 92272498001** Collected: 10/19/15 10:52 Received: 10/20/15 10:01 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		10/22/15 19:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		10/22/15 19:31	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		10/22/15 19:31	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		10/22/15 19:31	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		10/22/15 19:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		10/22/15 19:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		10/22/15 19:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		10/22/15 19:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		10/22/15 19:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		10/22/15 19:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		10/22/15 19:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		10/22/15 19:31	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		10/22/15 19:31	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		10/22/15 19:31	591-78-6	
Iodomethane	ND	ug/L	5.0	1		10/22/15 19:31	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		10/22/15 19:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		10/22/15 19:31	108-10-1	
Styrene	ND	ug/L	1.0	1		10/22/15 19:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		10/22/15 19:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		10/22/15 19:31	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		10/22/15 19:31	127-18-4	
Toluene	ND	ug/L	1.0	1		10/22/15 19:31	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		10/22/15 19:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		10/22/15 19:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		10/22/15 19:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		10/22/15 19:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		10/22/15 19:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		10/22/15 19:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		10/22/15 19:31	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		10/22/15 19:31	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		10/22/15 19:31	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		10/22/15 19:31	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		10/22/15 19:31	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**620**	mg/L	250	1		10/21/15 09:09		

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: GWD/2602
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92272498001

METHOD BLANK: 1588722
Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/22/15 12:00	
Fluoride	mg/L	ND	0.10	10/22/15 12:00	
Sulfate	mg/L	ND	1.0	10/22/15 12:00	

LABORATORY CONTROL SAMPLE: 1588723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.9	100	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	50	48.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1588724 1588725

Parameter	Units	92272498001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	241	50	50	288	277	95	72	90-110	4	20	M2,M6
Fluoride	mg/L	0.45	2.5	2.5	2.9	2.9	97	100	90-110	2	20	
Sulfate	mg/L	66.1	50	50	107	103	82	73	90-110	4	20	M2,M6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: MERP/8568
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Associated Lab Samples: 92272498001

METHOD BLANK: 1587687
Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/26/15 12:58	

LABORATORY CONTROL SAMPLE: 1587688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587689 1587690

Parameter	Units	92272498001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.0	2.1	81	84	75-125	3	25	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: MPRP/19912
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92272498001

METHOD BLANK: 1593136
Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	10/28/15 15:58	
Arsenic	ug/L	ND	10.0	10/28/15 15:58	
Barium	ug/L	ND	5.0	10/28/15 15:58	
Beryllium	ug/L	ND	1.0	10/28/15 15:58	
Cadmium	ug/L	ND	1.0	10/28/15 15:58	
Calcium	ug/L	ND	100	10/28/15 15:58	
Chromium	ug/L	ND	5.0	10/28/15 15:58	
Cobalt	ug/L	ND	5.0	10/28/15 15:58	
Copper	ug/L	ND	5.0	10/28/15 15:58	
Lead	ug/L	ND	5.0	10/28/15 15:58	
Molybdenum	ug/L	ND	5.0	10/28/15 15:58	
Nickel	ug/L	ND	5.0	10/28/15 15:58	
Selenium	ug/L	ND	10.0	10/28/15 15:58	
Silver	ug/L	ND	5.0	10/28/15 15:58	
Thallium	ug/L	ND	5.4	10/28/15 15:58	
Vanadium	ug/L	ND	5.0	10/28/15 15:58	
Zinc	ug/L	ND	10.0	10/28/15 15:58	

LABORATORY CONTROL SAMPLE: 1593137

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	525	105	80-120	
Arsenic	ug/L	500	498	100	80-120	
Barium	ug/L	500	489	98	80-120	
Beryllium	ug/L	500	495	99	80-120	
Cadmium	ug/L	500	500	100	80-120	
Calcium	ug/L	5000	4550	91	80-120	
Chromium	ug/L	500	494	99	80-120	
Cobalt	ug/L	500	546	109	80-120	
Copper	ug/L	500	504	101	80-120	
Lead	ug/L	500	496	99	80-120	
Molybdenum	ug/L	500	529	106	80-120	
Nickel	ug/L	500	494	99	80-120	
Selenium	ug/L	500	492	98	80-120	
Silver	ug/L	250	254	102	80-120	
Thallium	ug/L	500	504	101	80-120	
Vanadium	ug/L	500	517	103	80-120	
Zinc	ug/L	500	518	104	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1593138 1593139

Parameter	Units	92272498001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	5.6	500	500	525	517	104	102	75-125	1	25	
Arsenic	ug/L	ND	500	500	510	506	102	101	75-125	1	25	
Barium	ug/L	117	500	500	609	595	98	96	75-125	2	25	
Beryllium	ug/L	ND	500	500	502	492	100	98	75-125	2	25	
Cadmium	ug/L	ND	500	500	498	491	100	98	75-125	1	25	
Calcium	ug/L	38100	5000	5000	43400	41600	107	70	75-125	4	25	M1
Chromium	ug/L	ND	500	500	497	483	99	96	75-125	3	25	
Cobalt	ug/L	ND	500	500	529	519	106	104	75-125	2	25	
Copper	ug/L	ND	500	500	506	501	101	100	75-125	1	25	
Lead	ug/L	ND	500	500	470	462	94	92	75-125	2	25	
Molybdenum	ug/L	ND	500	500	533	524	106	104	75-125	2	25	
Nickel	ug/L	ND	500	500	479	470	95	93	75-125	2	25	
Selenium	ug/L	ND	500	500	487	480	97	96	75-125	1	25	
Silver	ug/L	ND	250	250	254	251	101	100	75-125	1	25	
Thallium	ug/L	ND	500	500	456	452	91	90	75-125	1	25	
Vanadium	ug/L	ND	500	500	530	516	106	103	75-125	3	25	
Zinc	ug/L	11.5	500	500	528	508	103	99	75-125	4	25	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: MPRP/59095
QC Batch Method: EPA 3020
Analysis Method: EPA 6020A
Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92272498001

METHOD BLANK: 2118485
Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	10/27/15 13:46	
Lithium	ug/L	ND	0.50	10/27/15 13:46	

LABORATORY CONTROL SAMPLE: 2118486

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	80.2	100	80-120	
Lithium	ug/L	80	85.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2118487 2118488

Parameter	Units	92272367001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	53.1	80	80	161	158	135	132	75-125	2	20	M1
Lithium	ug/L	23.5	80	80	110	107	108	105	75-125	3	20	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: MSV/33919
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92272498001

METHOD BLANK: 1588822
Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1,1-Trichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1,2-Trichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1-Dichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,1-Dichloroethene	ug/L	ND	1.0	10/22/15 18:57	
1,2,3-Trichloropropane	ug/L	ND	1.0	10/22/15 18:57	
1,2-Dichlorobenzene	ug/L	ND	1.0	10/22/15 18:57	
1,2-Dichloroethane	ug/L	ND	1.0	10/22/15 18:57	
1,2-Dichloropropane	ug/L	ND	1.0	10/22/15 18:57	
1,4-Dichlorobenzene	ug/L	ND	1.0	10/22/15 18:57	
2-Butanone (MEK)	ug/L	ND	5.0	10/22/15 18:57	
2-Hexanone	ug/L	ND	5.0	10/22/15 18:57	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	10/22/15 18:57	
Acetone	ug/L	ND	25.0	10/22/15 18:57	
Acrylonitrile	ug/L	ND	10.0	10/22/15 18:57	
Benzene	ug/L	ND	1.0	10/22/15 18:57	
Bromochloromethane	ug/L	ND	1.0	10/22/15 18:57	
Bromodichloromethane	ug/L	ND	1.0	10/22/15 18:57	
Bromoform	ug/L	ND	1.0	10/22/15 18:57	
Bromomethane	ug/L	ND	2.0	10/22/15 18:57	
Carbon disulfide	ug/L	ND	2.0	10/22/15 18:57	
Carbon tetrachloride	ug/L	ND	1.0	10/22/15 18:57	
Chlorobenzene	ug/L	ND	1.0	10/22/15 18:57	
Chloroethane	ug/L	ND	1.0	10/22/15 18:57	
Chloroform	ug/L	ND	1.0	10/22/15 18:57	
Chloromethane	ug/L	ND	1.0	10/22/15 18:57	
cis-1,2-Dichloroethene	ug/L	ND	1.0	10/22/15 18:57	
cis-1,3-Dichloropropene	ug/L	ND	1.0	10/22/15 18:57	
Dibromochloromethane	ug/L	ND	1.0	10/22/15 18:57	
Dibromomethane	ug/L	ND	1.0	10/22/15 18:57	
Ethylbenzene	ug/L	ND	1.0	10/22/15 18:57	
Iodomethane	ug/L	ND	5.0	10/22/15 18:57	
Methylene Chloride	ug/L	ND	1.0	10/22/15 18:57	
Styrene	ug/L	ND	1.0	10/22/15 18:57	
Tetrachloroethene	ug/L	ND	1.0	10/22/15 18:57	
Toluene	ug/L	ND	1.0	10/22/15 18:57	
trans-1,2-Dichloroethene	ug/L	ND	1.0	10/22/15 18:57	
trans-1,3-Dichloropropene	ug/L	ND	1.0	10/22/15 18:57	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	10/22/15 18:57	
Trichloroethene	ug/L	ND	1.0	10/22/15 18:57	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

METHOD BLANK: 1588822 Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	10/22/15 18:57	
Vinyl acetate	ug/L	ND	2.0	10/22/15 18:57	
Vinyl chloride	ug/L	ND	1.0	10/22/15 18:57	
Xylene (Total)	ug/L	ND	2.0	10/22/15 18:57	
1,2-Dichloroethane-d4 (S)	%	96	70-130	10/22/15 18:57	
4-Bromofluorobenzene (S)	%	102	70-130	10/22/15 18:57	
Toluene-d8 (S)	%	100	70-130	10/22/15 18:57	

LABORATORY CONTROL SAMPLE: 1588823

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	47.0	94	80-125	
1,1,1-Trichloroethane	ug/L	50	52.4	105	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	50.1	100	79-124	
1,1,2-Trichloroethane	ug/L	50	48.2	96	85-125	
1,1-Dichloroethane	ug/L	50	50.1	100	73-126	
1,1-Dichloroethene	ug/L	50	53.3	107	66-135	
1,2,3-Trichloropropane	ug/L	50	47.6	95	75-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	80-133	
1,2-Dichloroethane	ug/L	50	44.5	89	67-128	
1,2-Dichloropropane	ug/L	50	48.9	98	75-132	
1,4-Dichlorobenzene	ug/L	50	50.6	101	78-130	
2-Butanone (MEK)	ug/L	100	95.0	95	61-144	
2-Hexanone	ug/L	100	100	100	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.6	100	72-135	
Acetone	ug/L	100	101	101	48-146	
Acrylonitrile	ug/L	250	242	97	40-160	
Benzene	ug/L	50	50.0	100	80-125	
Bromochloromethane	ug/L	50	52.3	105	71-125	
Bromodichloromethane	ug/L	50	53.9	108	78-124	
Bromoform	ug/L	50	42.0	84	71-128	
Bromomethane	ug/L	50	51.8	104	40-160	
Carbon disulfide	ug/L	50	56.9	114	50-160	
Carbon tetrachloride	ug/L	50	47.7	95	69-131	
Chlorobenzene	ug/L	50	49.6	99	81-122	
Chloroethane	ug/L	50	45.1	90	39-148	
Chloroform	ug/L	50	50.9	102	73-127	
Chloromethane	ug/L	50	48.2	96	44-146	
cis-1,2-Dichloroethene	ug/L	50	48.5	97	74-124	
cis-1,3-Dichloropropene	ug/L	50	52.9	106	72-132	
Dibromochloromethane	ug/L	50	47.0	94	78-125	
Dibromomethane	ug/L	50	50.6	101	82-120	
Ethylbenzene	ug/L	50	49.6	99	79-121	
Iodomethane	ug/L	100	110	110	39-154	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

LABORATORY CONTROL SAMPLE: 1588823

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	48.6	97	64-133	
Styrene	ug/L	50	51.0	102	84-126	
Tetrachloroethene	ug/L	50	51.2	102	78-122	
Toluene	ug/L	50	48.8	98	80-121	
trans-1,2-Dichloroethene	ug/L	50	49.6	99	71-127	
trans-1,3-Dichloropropene	ug/L	50	47.5	95	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	51.6	103	40-160	
Trichloroethene	ug/L	50	48.3	97	78-122	
Trichlorofluoromethane	ug/L	50	46.9	94	53-137	
Vinyl acetate	ug/L	100	99.2	99	40-160	
Vinyl chloride	ug/L	50	57.7	115	58-137	
Xylene (Total)	ug/L	150	150	100	81-126	
1,2-Dichloroethane-d4 (S)	%			95	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1588824 1588825

Parameter	Units	92272094005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	17.2	20.2	86	101	70-130	16	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.5	24.9	112	124	70-130	10	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	19.2	21.4	96	107	70-130	11	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	20.4	21.2	102	106	70-130	4	30	
1,1-Dichloroethane	ug/L	ND	20	20	21.1	23.2	106	116	70-130	9	30	
1,1-Dichloroethene	ug/L	ND	20	20	25.0	24.9	125	124	70-166	0	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	20.3	21.1	102	106	70-130	4	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	20.5	21.5	102	107	70-130	5	30	
1,2-Dichloroethane	ug/L	ND	20	20	20.5	21.3	102	106	70-130	4	30	
1,2-Dichloropropane	ug/L	ND	20	20	20.8	21.7	104	108	70-130	4	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	21.2	21.6	106	108	70-130	2	30	
2-Butanone (MEK)	ug/L	ND	40	40	40.9	44.7	102	112	70-130	9	30	
2-Hexanone	ug/L	ND	40	40	45.6	45.5	114	114	70-130	0	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	45.7	45.0	114	113	70-130	2	30	
Acetone	ug/L	ND	40	40	40.8	50.5	102	126	70-130	21	30	
Acrylonitrile	ug/L	ND	100	100	98.1	113	98	113	70-130	14	30	
Benzene	ug/L	ND	20	20	21.5	22.5	107	113	70-148	5	30	
Bromochloromethane	ug/L	ND	20	20	20.4	22.3	102	112	70-130	9	30	
Bromodichloromethane	ug/L	ND	20	20	20.1	22.0	101	110	70-130	9	30	
Bromoform	ug/L	ND	20	20	14.9	17.7	75	89	70-130	17	30	
Bromomethane	ug/L	ND	20	20	30.1	25.0	151	125	70-130	19	30	M1
Carbon disulfide	ug/L	ND	20	20	22.9	22.9	114	114	70-130	0	30	
Carbon tetrachloride	ug/L	ND	20	20	20.8	22.3	104	112	70-130	7	30	
Chlorobenzene	ug/L	ND	20	20	20.8	21.6	104	108	70-146	4	30	

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REPORT OF LABORATORY ANALYSIS

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1588824 1588825

Parameter	Units	92272094005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloroethane	ug/L	ND	20	20	21.5	20.5	107	103	70-130	4	30	
Chloroform	ug/L	ND	20	20	21.6	23.2	108	116	70-130	7	30	
Chloromethane	ug/L	ND	20	20	22.9	23.4	114	117	70-130	2	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	20.1	22.2	100	111	70-130	10	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	18.5	20.3	92	102	70-130	10	30	
Dibromochloromethane	ug/L	ND	20	20	15.6	18.9	78	95	70-130	19	30	
Dibromomethane	ug/L	ND	20	20	20.8	21.3	104	106	70-130	3	30	
Ethylbenzene	ug/L	ND	20	20	21.1	22.3	106	111	70-130	5	30	
Iodomethane	ug/L	0.87J	40	40	42.1	41.3	103	101	70-130	2	30	
Methylene Chloride	ug/L	ND	20	20	19.0	22.7	95	113	70-130	18	30	
Styrene	ug/L	ND	20	20	20.7	21.8	103	109	70-130	6	30	
Tetrachloroethene	ug/L	ND	20	20	22.1	22.7	111	113	70-130	2	30	
Toluene	ug/L	ND	20	20	21.6	21.8	107	108	70-155	1	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	20.6	23.0	103	115	70-130	11	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	17.5	19.4	87	97	70-130	10	30	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	20	17.2	19.6	86	98	70-130	13	30	
Trichloroethene	ug/L	ND	20	20	21.1	22.1	105	110	69-151	5	30	
Trichlorofluoromethane	ug/L	ND	20	20	24.0	24.6	120	123	70-130	2	30	
Vinyl acetate	ug/L	ND	40	40	32.3	36.0	81	90	70-130	11	30	
Vinyl chloride	ug/L	ND	20	20	25.6	25.6	128	128	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						105	105	70-130			
4-Bromofluorobenzene (S)	%						100	103	70-130			
Toluene-d8 (S)	%						102	99	70-130			

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: WET/40946 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92272498001

METHOD BLANK: 1587360 | Matrix: Water
Associated Lab Samples: 92272498001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	10/21/15 09:06	

LABORATORY CONTROL SAMPLE: 1587361

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	228	91	90-110	

SAMPLE DUPLICATE: 1587362

Parameter	Units	92272182007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5940	6110	3	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Sample: MW-6 **Lab ID: 92272498001** Collected: 10/19/15 10:52 Received: 10/20/15 10:01 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.172 ± 0.393 (0.634)** **C:NA T:94%**	pCi/L	11/02/15 14:17	13982-63-3	
Radium-228	EPA 904.0	**0.395 ± 0.347 (0.699)** **C:80% T:84%**	pCi/L	11/02/15 19:21	15262-20-1	
Total Radium	Total Radium Calculation	**0.567 ± 0.740 (1.33)**	pCi/L	11/03/15 17:02	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: RADC/26599 | Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 | Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92272498001

METHOD BLANK: 974294 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.264 ± 0.402 (0.647) C:NA T:93%	pCi/L	11/02/15 13:07	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

QC Batch: RADC/26585 | Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 | Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92272498001

METHOD BLANK: 973252 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.440 ± 0.374 (0.753) C:78% T:84%	pCi/L	11/02/15 19:20	

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QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M2	Matrix spike recovery was below QC limits due to sample dilution. Data acceptance based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92272498

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272498001	**MW-6**	EPA 300.0	GWD/2602		
92272498001	**MW-6**	EPA 3010	MPRP/19912	EPA 6010	ICP/17953
92272498001	**MW-6**	EPA 3020	MPRP/59095	EPA 6020A	ICPM/27161
92272498001	**MW-6**	EPA 7470	MERP/8568	EPA 7470	MERC/8230
92272498001	**MW-6**	EPA 8260	MSV/33919		
92272498001	**MW-6**	EPA 903.1	RADC/26599		
92272498001	**MW-6**	EPA 904.0	RADC/26585		
92272498001	**MW-6**	Total Radium Calculation	RADC/26691		
92272498001	**MW-6**	SM 2540C	WET/40946		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 16, 2016 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USP ☐ Client ☐ Commercial ☐ Pace Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1402 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

Temp Correction Factor **T1402** No Correction

Corrected Cooler Temp.: 1.0 °C **Biological Tissue is Frozen:** Yes No N/A

Date and Initials of person examining contents: TH 10/20/15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:	DR	**Date:**	10/20/15
SRF Review:	DR	**Date:**	10/20/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92272498

92272498

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1821678

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HDR	Report To: Same	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Charrah - Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- ☐ NPDES
- ☑ GROUND WATER
- ☐ DRINKING WATER
- ☐ UST
- ☐ RCRA
- ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Radium 226	Metals	TDS	Chloride/Sulfate	Fluoride	VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-6		G			10/19/15	1052		11										3	2	1	1	1	3		001
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

92272498

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	10/19/15	1335	Scott Leep PACE	10-20-15	1001				
	Scott Leepe PACE	10-20-15	1415	Tyrick Hoch PACE	10-20-15	1415	1.0	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 10/19/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Charah-Brickhaven

Name and Afiliation (Sampler(s)): C.S, G.G / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-6 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 28.90 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 7.63 ft Casing Volume: 3.4670 gallons

Height of Water Column: 21.27 ft Cal. 3 Volumes: 10.4003 gallons

Purge Information

Date Purged: 10 / 19 / 15 Start Time: 0957 Finish: 1052 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 5500 ~~gallons~~ ml

Sampling Information

Date Collected: 10/19/15 Time Collected: 1052 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium x3, metals x2
		TDS, Chloride / Sulfate,
		Fluoride, VOC x3

Field Measurements/Observations

Sample Temp (°C): 17.4 Time: 1052 Turbidity (ntu): 8.78 Time: 1052

Sample pH (s.u.): 6.65 Time: — Diss Oxy (mg/L): 0.94 Time: 1052

Specific Cond. (uS): 1183 Time: — Res. Cl (mg/L): — Time: —

ReDox (mV): 50.2 Time: — Other: Iron 0.0 mg/L Time: 1052

Odor: None Time: — Appearance: Clear

General/Weather Observations

Sunny, Cool. Down slope. Damaged well. Developed 10/16/15, Sampled 10/19/15

Sampler Signature/Date: Clint Sorrell / 10/19/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level
1002	6.63	1270	127.8	21.99	2.43	16.4	500 mL	8.00 ft
1007	6.73	1275	121.2	21.05	1.66	17.2	1000 mL	8.40 ft
1017	6.77	1272	111.2	14.43	1.37	16.9	2000 mL	8.30 ft
1022	6.77	1268	92.5	12.62	1.21	17.1	2500 mL	8.25 ft
1027	6.75		87.9	10.33	1.07	17.2	3000 mL	8.25 ft

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Cherrah - Brickshaven

Well ID: MW-6

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
				9.25				Water Level:
1032	6.74	1250	82.2	~~14.05~~	1.06	17.4	3500mL	8.25ft
1037	6.72	1238	73.9	8.39	0.99	17.3	4000mL	8.25ft
1042	6.66	1201	57.2	8.31	0.95	17.1	4500mL	8.25ft
1047	6.65	1193	54.3	8.52	0.95	17.1	5000mL	8.25ft
1052	6.65	1183	50.2	8.78	0.94	17.4	5500mL	8.25ft

F

Appendix F – 3rd Round Laboratory Reports, Field Data Sheets, and Chains of Custody (November 2015)

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

December 03, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on November 18, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92277031001	**SW-2**	Water	11/18/15 10:10	11/18/15 18:30
92277031002	**SW-1**	Water	11/18/15 10:50	11/18/15 18:30
92277031003	**BG-1**	Water	11/18/15 13:10	11/18/15 18:30
92277031004	**LEACHATE-1**	Water	11/18/15 14:30	11/18/15 18:30
92277031005	**MW-5**	Water	11/18/15 16:25	11/18/15 18:30
92277031006	**AMBIENT/FIELD BLANK**	Water	11/18/15 17:00	11/18/15 18:30
92277031007	**EQUIPMENT BLANK**	Water	11/18/15 17:15	11/18/15 18:30
92277031008	**TRIP BLANK**	Water	11/18/15 00:00	11/18/15 18:30

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SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92277031001	**SW-2**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031002	**SW-1**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031003	**BG-1**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031004	**LEACHATE-1**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031005	**MW-5**	EPA 300.0	CDC	3	PASI-G

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SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031006	**AMBIENT/FIELD BLANK**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031007	**EQUIPMENT BLANK**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277031008	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277031001	**SW-2**					
EPA 300.0	Chloride	5.6	mg/L	1.0	11/24/15 14:01	
EPA 300.0	Sulfate	5.2	mg/L	1.0	11/24/15 14:01	
EPA 6010	Barium	69.7	ug/L	5.0	11/24/15 23:22	
EPA 6010	Calcium	8110	ug/L	100	11/24/15 23:22	
EPA 6010	Cobalt	7.9	ug/L	5.0	11/24/15 23:22	
EPA 6010	Thallium	6.7	ug/L	5.4	11/25/15 19:06	
EPA 6010	Vanadium	7.0	ug/L	5.0	11/24/15 23:22	
EPA 6020	Boron	21.9	ug/L	5.0	11/24/15 08:04	
EPA 903.1	Radium-226	0.172 ± 0.571 (0.960) C:NA T:63%	pCi/L		11/30/15 12:26	
EPA 904.0	Radium-228	0.391 ± 0.370 (0.753) C:80% T:72%	pCi/L		11/30/15 18:48	
SM 2540C	Total Dissolved Solids	117	mg/L	25.0	11/22/15 10:50	
92277031002	**SW-1**					
EPA 300.0	Chloride	7.0	mg/L	1.0	11/24/15 15:14	
EPA 300.0	Sulfate	10.5	mg/L	1.0	11/24/15 15:14	
EPA 6010	Barium	105	ug/L	5.0	11/24/15 23:31	
EPA 6010	Calcium	3290	ug/L	100	11/24/15 23:31	
EPA 6010	Chromium	8.7	ug/L	5.0	11/24/15 23:31	
EPA 6010	Copper	6.6	ug/L	5.0	11/24/15 23:31	
EPA 6010	Lead	7.6	ug/L	5.0	11/24/15 23:31	
EPA 6010	Vanadium	20.3	ug/L	5.0	11/24/15 23:31	
EPA 6010	Zinc	23.7	ug/L	10.0	11/24/15 23:31	
EPA 6020	Boron	13.0	ug/L	5.0	11/24/15 08:12	
EPA 6020	Lithium	6.4	ug/L	0.50	11/24/15 08:12	
EPA 903.1	Radium-226	0.147 ± 0.407 (0.789) C:NA T:82%	pCi/L		11/30/15 12:32	
EPA 904.0	Radium-228	1.94 ± 0.555 (0.638) C:85% T:83%	pCi/L		11/30/15 18:48	
SM 2540C	Total Dissolved Solids	292	mg/L	25.0	11/22/15 10:50	
92277031003	**BG-1**					
EPA 300.0	Chloride	283	mg/L	6.0	11/25/15 05:18	
EPA 300.0	Fluoride	0.12	mg/L	0.10	11/24/15 15:38	
EPA 300.0	Sulfate	17.5	mg/L	1.0	11/24/15 15:38	
EPA 6010	Barium	344	ug/L	5.0	11/24/15 23:34	
EPA 6010	Calcium	31700	ug/L	100	11/24/15 23:34	
EPA 6020	Boron	5.9	ug/L	5.0	11/23/15 15:47	
EPA 6020	Lithium	12.1	ug/L	0.50	11/23/15 15:47	

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SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277031003	**BG-1**					
EPA 903.1	Radium-226	0.800 ± 0.736 (0.434) C:NA T:91%	pCi/L		11/30/15 11:50	
EPA 904.0	Radium-228	1.29 ± 0.542 (0.863) C:85% T:75%	pCi/L		11/30/15 18:49	
SM 2540C	Total Dissolved Solids	652	mg/L	50.0	11/22/15 10:50	
92277031004	**LEACHATE-1**					
EPA 300.0	Chloride	2.3	mg/L	1.0	11/24/15 16:03	
EPA 300.0	Sulfate	3.5	mg/L	1.0	11/24/15 16:03	
EPA 6010	Barium	9.1	ug/L	5.0	11/24/15 23:37	
EPA 6010	Calcium	4540	ug/L	100	11/24/15 23:37	
EPA 6010	Zinc	39.9	ug/L	10.0	11/24/15 23:37	
EPA 6020	Boron	17.1	ug/L	5.0	11/23/15 15:49	
EPA 6020	Lithium	6.5	ug/L	0.50	11/23/15 15:49	
EPA 903.1	Radium-226	0.137 ± 0.501 (0.963) C:NA T:91%	pCi/L		11/30/15 11:57	
EPA 904.0	Radium-228	0.0712 ± 0.265 (0.601) C:85% T:86%	pCi/L		11/30/15 18:49	
SM 2540C	Total Dissolved Solids	27.0	mg/L	25.0	11/22/15 10:50	
92277031005	**MW-5**					
EPA 300.0	Chloride	21.7	mg/L	1.0	11/24/15 16:27	
EPA 300.0	Fluoride	0.59	mg/L	0.10	11/24/15 16:27	
EPA 300.0	Sulfate	3.1	mg/L	1.0	11/24/15 16:27	
EPA 6010	Barium	93.2	ug/L	5.0	11/24/15 23:41	
EPA 6010	Calcium	12400	ug/L	100	11/24/15 23:41	
EPA 6020	Boron	9.9	ug/L	5.0	11/23/15 15:52	
EPA 6020	Lithium	7.4	ug/L	0.50	11/23/15 15:52	
EPA 903.1	Radium-226	0.592 ± 0.470 (0.611) C:NA T:94%	pCi/L		11/30/15 12:47	
EPA 904.0	Radium-228	0.359 ± 0.312 (0.626) C:86% T:86%	pCi/L		11/30/15 19:09	
SM 2540C	Total Dissolved Solids	235	mg/L	25.0	11/22/15 10:52	
92277031006	**AMBIENT/FIELD BLANK**					
EPA 6010	Calcium	295	ug/L	100	11/24/15 23:44	
EPA 8260	Methylene Chloride	10.5	ug/L	1.0	11/21/15 13:44	

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SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277031006	**AMBIENT/FIELD BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.306 (0.622) C:NA T:102%	pCi/L		11/30/15 12:47	
EPA 904.0	Radium-228	0.514 ± 0.335 (0.639) C:83% T:91%	pCi/L		11/30/15 18:48	
92277031007	**EQUIPMENT BLANK**					
EPA 8260	Methylene Chloride	1.6	ug/L	1.0	11/21/15 14:01	C9
EPA 903.1	Radium-226	0.0683 ± 0.312 (0.185) C:NA T:89%	pCi/L		11/30/15 12:38	
EPA 904.0	Radium-228	0.227 ± 0.322 (0.692) C:83% T:81%	pCi/L		11/30/15 18:49	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: SW-2 **Lab ID: 92277031001** Collected: 11/18/15 10:10 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**5.6**	mg/L	1.0	1		11/24/15 14:01	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 14:01	16984-48-8	
Sulfate	**5.2**	mg/L	1.0	1		11/24/15 14:01	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:22	7440-38-2	
Barium	**69.7**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:22	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:22	7440-43-9	
Calcium	**8110**	ug/L	100	1	11/23/15 20:30	11/24/15 23:22	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-47-3	
Cobalt	**7.9**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-48-4	
Copper	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-50-8	
Lead	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:22	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-22-4	
Thallium	**6.7**	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:06	7440-28-0	
Vanadium	**7.0**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:22	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:22	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**21.9**	ug/L	5.0	1	11/23/15 11:42	11/24/15 08:04	7440-42-8	
Lithium	ND	ug/L	0.50	1	11/23/15 11:42	11/24/15 08:04	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 16:42	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 12:19	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 12:19	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 12:19	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 12:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 12:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 12:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 12:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 12:19	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 12:19	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 12:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 12:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 12:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 12:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 12:19	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 12:19	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: SW-2 **Lab ID: 92277031001** Collected: 11/18/15 10:10 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 12:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 12:19	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 12:19	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 12:19	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 12:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 12:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 12:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 12:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 12:19	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 12:19	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 12:19	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 12:19	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 12:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 12:19	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 12:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 12:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 12:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 12:19	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 12:19	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 12:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 12:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 12:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 12:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 12:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 12:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 12:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 12:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		11/21/15 12:19	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		11/21/15 12:19	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		11/21/15 12:19	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**117**	mg/L	25.0	1		11/22/15 10:50		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: SW-1 **Lab ID: 92277031002** Collected: 11/18/15 10:50 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**7.0**	mg/L	1.0	1		11/24/15 15:14	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 15:14	16984-48-8	
Sulfate	**10.5**	mg/L	1.0	1		11/24/15 15:14	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:31	7440-38-2	
Barium	**105**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:31	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:31	7440-43-9	
Calcium	**3290**	ug/L	100	1	11/23/15 20:30	11/24/15 23:31	7440-70-2	
Chromium	**8.7**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-48-4	
Copper	**6.6**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-50-8	
Lead	**7.6**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:31	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:24	7440-28-0	
Vanadium	**20.3**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:31	7440-62-2	
Zinc	**23.7**	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:31	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**13.0**	ug/L	5.0	1	11/23/15 11:42	11/24/15 08:12	7440-42-8	
Lithium	**6.4**	ug/L	0.50	1	11/23/15 11:42	11/24/15 08:12	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 16:49	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 12:36	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 12:36	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 12:36	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 12:36	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 12:36	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 12:36	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 12:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 12:36	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 12:36	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 12:36	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 12:36	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 12:36	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 12:36	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 12:36	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 12:36	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: SW-1 **Lab ID: 92277031002** Collected: 11/18/15 10:50 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 12:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 12:36	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 12:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 12:36	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 12:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 12:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 12:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 12:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 12:36	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 12:36	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 12:36	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 12:36	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 12:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 12:36	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 12:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 12:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 12:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 12:36	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 12:36	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 12:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 12:36	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 12:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 12:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 12:36	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 12:36	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 12:36	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 12:36	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		11/21/15 12:36	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		11/21/15 12:36	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		11/21/15 12:36	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**292**	mg/L	25.0	1		11/22/15 10:50		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: BG-1 **Lab ID: 92277031003** Collected: 11/18/15 13:10 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**283**	mg/L	6.0	6		11/25/15 05:18	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		11/24/15 15:38	16984-48-8	
Sulfate	**17.5**	mg/L	1.0	1		11/24/15 15:38	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:34	7440-38-2	
Barium	**344**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:34	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:34	7440-43-9	
Calcium	**31700**	ug/L	100	1	11/23/15 20:30	11/24/15 23:34	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-48-4	
Copper	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-50-8	
Lead	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:34	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:27	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:34	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:34	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**5.9**	ug/L	5.0	1	11/23/15 11:42	11/23/15 15:47	7440-42-8	
Lithium	**12.1**	ug/L	0.50	1	11/23/15 11:42	11/23/15 15:47	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 16:52	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 12:53	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 12:53	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 12:53	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 12:53	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 12:53	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 12:53	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 12:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 12:53	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 12:53	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 12:53	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 12:53	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 12:53	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 12:53	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 12:53	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 12:53	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: BG-1 **Lab ID: 92277031003** Collected: 11/18/15 13:10 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 12:53	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 12:53	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 12:53	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 12:53	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 12:53	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 12:53	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 12:53	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 12:53	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 12:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 12:53	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 12:53	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 12:53	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 12:53	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 12:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 12:53	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 12:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 12:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 12:53	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 12:53	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 12:53	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 12:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 12:53	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 12:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 12:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 12:53	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 12:53	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 12:53	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 12:53	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		11/21/15 12:53	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		11/21/15 12:53	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		11/21/15 12:53	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**652**	mg/L	50.0	1		11/22/15 10:50		

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: LEACHATE-1 **Lab ID: 92277031004** Collected: 11/18/15 14:30 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**2.3**	mg/L	1.0	1		11/24/15 16:03	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 16:03	16984-48-8	
Sulfate	**3.5**	mg/L	1.0	1		11/24/15 16:03	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:37	7440-38-2	
Barium	**9.1**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:37	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:37	7440-43-9	
Calcium	**4540**	ug/L	100	1	11/23/15 20:30	11/24/15 23:37	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-48-4	
Copper	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-50-8	
Lead	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:37	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:30	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:37	7440-62-2	
Zinc	**39.9**	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:37	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**17.1**	ug/L	5.0	1	11/23/15 11:42	11/23/15 15:49	7440-42-8	
Lithium	**6.5**	ug/L	0.50	1	11/23/15 11:42	11/23/15 15:49	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 16:54	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 13:10	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 13:10	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 13:10	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 13:10	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 13:10	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 13:10	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 13:10	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 13:10	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 13:10	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 13:10	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 13:10	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 13:10	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 13:10	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 13:10	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 13:10	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: LEACHATE-1 **Lab ID: 92277031004** Collected: 11/18/15 14:30 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 13:10	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 13:10	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 13:10	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 13:10	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 13:10	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 13:10	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 13:10	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 13:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 13:10	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 13:10	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 13:10	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 13:10	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 13:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 13:10	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 13:10	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 13:10	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 13:10	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 13:10	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 13:10	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 13:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 13:10	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 13:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 13:10	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 13:10	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 13:10	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 13:10	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 13:10	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		11/21/15 13:10	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		11/21/15 13:10	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 13:10	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**27.0**	mg/L	25.0	1		11/22/15 10:50		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: MW-5 **Lab ID: 92277031005** Collected: 11/18/15 16:25 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**21.7**	mg/L	1.0	1		11/24/15 16:27	16887-00-6	
Fluoride	**0.59**	mg/L	0.10	1		11/24/15 16:27	16984-48-8	
Sulfate	**3.1**	mg/L	1.0	1		11/24/15 16:27	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:41	7440-38-2	
Barium	**93.2**	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:41	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:41	7440-43-9	
Calcium	**12400**	ug/L	100	1	11/23/15 20:30	11/24/15 23:41	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-48-4	
Copper	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-50-8	
Lead	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:41	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:33	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:41	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:41	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**9.9**	ug/L	5.0	1	11/23/15 11:42	11/23/15 15:52	7440-42-8	
Lithium	**7.4**	ug/L	0.50	1	11/23/15 11:42	11/23/15 15:52	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 16:56	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 13:27	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 13:27	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 13:27	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 13:27	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 13:27	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 13:27	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 13:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 13:27	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 13:27	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 13:27	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 13:27	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 13:27	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 13:27	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 13:27	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 13:27	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: MW-5 **Lab ID: 92277031005** Collected: 11/18/15 16:25 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 13:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 13:27	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 13:27	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 13:27	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 13:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 13:27	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:27	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 13:27	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 13:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 13:27	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 13:27	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 13:27	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 13:27	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 13:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 13:27	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 13:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 13:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 13:27	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 13:27	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 13:27	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 13:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 13:27	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 13:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 13:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 13:27	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 13:27	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 13:27	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 13:27	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		11/21/15 13:27	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		11/21/15 13:27	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/21/15 13:27	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**235**	mg/L	25.0	1		11/22/15 10:52		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277031006** Collected: 11/18/15 17:00 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		11/24/15 16:51	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 16:51	16984-48-8	
Sulfate	ND	mg/L	1.0	1		11/24/15 16:51	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:44	7440-38-2	
Barium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:44	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:44	7440-43-9	
Calcium	**295**	ug/L	100	1	11/23/15 20:30	11/24/15 23:44	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-48-4	
Copper	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-50-8	
Lead	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:44	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:36	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:44	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:44	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	11/23/15 11:42	11/23/15 15:54	7440-42-8	
Lithium	ND	ug/L	0.50	1	11/23/15 11:42	11/23/15 15:54	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 16:59	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 13:44	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 13:44	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 13:44	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 13:44	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 13:44	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 13:44	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 13:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 13:44	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 13:44	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 13:44	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 13:44	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 13:44	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 13:44	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 13:44	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 13:44	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277031006** Collected: 11/18/15 17:00 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 13:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 13:44	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 13:44	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 13:44	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 13:44	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 13:44	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 13:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 13:44	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 13:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 13:44	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 13:44	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 13:44	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 13:44	74-88-4	
Methylene Chloride	**10.5**	ug/L	1.0	1		11/21/15 13:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 13:44	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 13:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 13:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 13:44	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 13:44	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 13:44	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 13:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 13:44	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 13:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 13:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 13:44	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 13:44	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 13:44	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 13:44	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		11/21/15 13:44	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		11/21/15 13:44	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/21/15 13:44	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		11/22/15 10:52		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: EQUIPMENT BLANK **Lab ID: 92277031007** Collected: 11/18/15 17:15 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		11/24/15 17:16	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 17:16	16984-48-8	
Sulfate	ND	mg/L	1.0	1		11/24/15 17:16	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:56	7440-38-2	
Barium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:56	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/23/15 20:30	11/24/15 23:56	7440-43-9	
Calcium	ND	ug/L	100	1	11/23/15 20:30	11/24/15 23:56	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-48-4	
Copper	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-50-8	
Lead	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:56	7782-49-2	
Silver	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/23/15 20:30	11/25/15 19:39	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/23/15 20:30	11/24/15 23:56	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/23/15 20:30	11/24/15 23:56	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	11/23/15 11:42	11/23/15 15:57	7440-42-8	
Lithium	ND	ug/L	0.50	1	11/23/15 11:42	11/23/15 15:57	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/24/15 12:20	11/24/15 17:06	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 14:01	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 14:01	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 14:01	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 14:01	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 14:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 14:01	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 14:01	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 14:01	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 14:01	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 14:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 14:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 14:01	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 14:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 14:01	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 14:01	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: EQUIPMENT BLANK **Lab ID: 92277031007** Collected: 11/18/15 17:15 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 14:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 14:01	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 14:01	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 14:01	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 14:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 14:01	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 14:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 14:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 14:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 14:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 14:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 14:01	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 14:01	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 14:01	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 14:01	74-88-4	
Methylene Chloride	**1.6**	ug/L	1.0	1		11/21/15 14:01	75-09-2	C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 14:01	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 14:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 14:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 14:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 14:01	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 14:01	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 14:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 14:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 14:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 14:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 14:01	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 14:01	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 14:01	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 14:01	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		11/21/15 14:01	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		11/21/15 14:01	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 14:01	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		11/22/15 10:52		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: TRIP BLANK **Lab ID: 92277031008** Collected: 11/18/15 00:00 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 14:18	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 14:18	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 14:18	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 14:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 14:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 14:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 14:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 14:18	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 14:18	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 14:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 14:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 14:18	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 14:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 14:18	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 14:18	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/21/15 14:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 14:18	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 14:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 14:18	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 14:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 14:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 14:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 14:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 14:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 14:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 14:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 14:18	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 14:18	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 14:18	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 14:18	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 14:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 14:18	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 14:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 14:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 14:18	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 14:18	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 14:18	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 14:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 14:18	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 14:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 14:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 14:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 14:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 14:18	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 14:18	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		11/21/15 14:18	460-00-4	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: TRIP BLANK **Lab ID: 92277031008** Collected: 11/18/15 00:00 Received: 11/18/15 18:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		11/21/15 14:18	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/21/15 14:18	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: GWD/2690 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 1613797 — Matrix: Water
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/24/15 13:12	
Fluoride	mg/L	ND	0.10	11/24/15 13:12	
Sulfate	mg/L	ND	1.0	11/24/15 13:12	

LABORATORY CONTROL SAMPLE: 1613798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.6	101	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	50	48.6	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1613799 — 1613800

Parameter	Units	92277031001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.6	50	50	54.0	54.9	97	99	90-110	2	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	92	94	90-110	1	20	
Sulfate	mg/L	5.2	50	50	52.3	53.1	94	96	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1613801 — 1613802

Parameter	Units	92277140004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	287	50	50	331	332	88	90	90-110	0	20	M2,M6
Fluoride	mg/L	0.34	2.5	2.5	2.7	2.7	94	94	90-110	1	20	
Sulfate	mg/L	6.0	50	50	53.1	53.5	94	95	90-110	1	20	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: MERP/8693 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 1613619 Matrix: Water
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	11/24/15 16:37	

LABORATORY CONTROL SAMPLE: 1613620

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.8	112	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1613621 1613622

Parameter	Units	92277031001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.7	2.7	108	106	75-125	2	25	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: MPRP/20100 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 1613585 Matrix: Water
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	11/24/15 23:16	
Arsenic	ug/L	ND	10.0	11/24/15 23:16	
Barium	ug/L	ND	5.0	11/24/15 23:16	
Beryllium	ug/L	ND	1.0	11/24/15 23:16	
Cadmium	ug/L	ND	1.0	11/24/15 23:16	
Calcium	ug/L	ND	100	11/24/15 23:16	
Chromium	ug/L	ND	5.0	11/24/15 23:16	
Cobalt	ug/L	ND	5.0	11/24/15 23:16	
Copper	ug/L	ND	5.0	11/24/15 23:16	
Lead	ug/L	ND	5.0	11/24/15 23:16	
Molybdenum	ug/L	ND	5.0	11/24/15 23:16	
Nickel	ug/L	ND	5.0	11/24/15 23:16	
Selenium	ug/L	ND	10.0	11/24/15 23:16	
Silver	ug/L	ND	5.0	11/24/15 23:16	
Thallium	ug/L	ND	5.4	11/25/15 19:00	
Vanadium	ug/L	ND	5.0	11/24/15 23:16	
Zinc	ug/L	ND	10.0	11/24/15 23:16	

LABORATORY CONTROL SAMPLE: 1613586

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	483	97	80-120	
Arsenic	ug/L	500	468	94	80-120	
Barium	ug/L	500	452	90	80-120	
Beryllium	ug/L	500	451	90	80-120	
Cadmium	ug/L	500	472	94	80-120	
Calcium	ug/L	5000	4580	92	80-120	
Chromium	ug/L	500	460	92	80-120	
Cobalt	ug/L	500	475	95	80-120	
Copper	ug/L	500	467	93	80-120	
Lead	ug/L	500	470	94	80-120	
Molybdenum	ug/L	500	495	99	80-120	
Nickel	ug/L	500	470	94	80-120	
Selenium	ug/L	500	474	95	80-120	
Silver	ug/L	250	229	92	80-120	
Thallium	ug/L	500	461	92	80-120	
Vanadium	ug/L	500	460	92	80-120	
Zinc	ug/L	500	478	96	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1613587 1613588

Parameter	Units	92277031001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	502	521	100	104	75-125	4	25	
Arsenic	ug/L	ND	500	500	495	509	99	102	75-125	3	25	
Barium	ug/L	69.7	500	500	549	567	96	100	75-125	3	25	
Beryllium	ug/L	ND	500	500	478	497	96	99	75-125	4	25	
Cadmium	ug/L	ND	500	500	497	512	99	102	75-125	3	25	
Calcium	ug/L	8110	5000	5000	13000	13200	98	102	75-125	1	25	
Chromium	ug/L	ND	500	500	491	507	98	101	75-125	3	25	
Cobalt	ug/L	7.9	500	500	505	521	99	103	75-125	3	25	
Copper	ug/L	ND	500	500	503	520	100	103	75-125	3	25	
Lead	ug/L	ND	500	500	489	503	98	100	75-125	3	25	
Molybdenum	ug/L	ND	500	500	514	536	103	107	75-125	4	25	
Nickel	ug/L	ND	500	500	495	510	98	101	75-125	3	25	
Selenium	ug/L	ND	500	500	488	504	97	100	75-125	3	25	
Silver	ug/L	ND	250	250	244	251	97	101	75-125	3	25	
Thallium	ug/L	6.7	500	500	571	538	113	106	75-125	6	25	
Vanadium	ug/L	7.0	500	500	500	515	99	102	75-125	3	25	
Zinc	ug/L	ND	500	500	506	522	100	103	75-125	3	25	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: MPRP/59874 Analysis Method: EPA 6020
QC Batch Method: EPA 3020 Analysis Description: 6020 MET
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 2142103 Matrix: Water
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	11/23/15 15:11	
Lithium	ug/L	ND	0.50	11/23/15 15:11	

LABORATORY CONTROL SAMPLE: 2142104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	86.3	108	80-120	
Lithium	ug/L	80	90.1	113	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142105 2142106

Parameter	Units	92277031001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	21.9	80	80	105	106	104	105	75-125	0	20	
Lithium	ug/L	ND	80	80	88.0	87.0	110	108	75-125	1	20	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: MSV/34379 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007, 92277031008

METHOD BLANK: 1612653 Matrix: Water
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007, 92277031008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	11/21/15 11:45	
1,1,1-Trichloroethane	ug/L	ND	1.0	11/21/15 11:45	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	11/21/15 11:45	
1,1,2-Trichloroethane	ug/L	ND	1.0	11/21/15 11:45	
1,1-Dichloroethane	ug/L	ND	1.0	11/21/15 11:45	
1,1-Dichloroethene	ug/L	ND	1.0	11/21/15 11:45	
1,2,3-Trichloropropane	ug/L	ND	1.0	11/21/15 11:45	
1,2-Dichlorobenzene	ug/L	ND	1.0	11/21/15 11:45	
1,2-Dichloroethane	ug/L	ND	1.0	11/21/15 11:45	
1,2-Dichloropropane	ug/L	ND	1.0	11/21/15 11:45	
1,4-Dichlorobenzene	ug/L	ND	1.0	11/21/15 11:45	
2-Butanone (MEK)	ug/L	ND	5.0	11/21/15 11:45	
2-Hexanone	ug/L	ND	5.0	11/21/15 11:45	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	11/21/15 11:45	
Acetone	ug/L	ND	25.0	11/21/15 11:45	
Acrylonitrile	ug/L	ND	10.0	11/21/15 11:45	
Benzene	ug/L	ND	1.0	11/21/15 11:45	
Bromochloromethane	ug/L	ND	1.0	11/21/15 11:45	
Bromodichloromethane	ug/L	ND	1.0	11/21/15 11:45	
Bromoform	ug/L	ND	1.0	11/21/15 11:45	
Bromomethane	ug/L	ND	2.0	11/21/15 11:45	
Carbon disulfide	ug/L	ND	2.0	11/21/15 11:45	
Carbon tetrachloride	ug/L	ND	1.0	11/21/15 11:45	
Chlorobenzene	ug/L	ND	1.0	11/21/15 11:45	
Chloroethane	ug/L	ND	1.0	11/21/15 11:45	
Chloroform	ug/L	ND	1.0	11/21/15 11:45	
Chloromethane	ug/L	ND	1.0	11/21/15 11:45	
cis-1,2-Dichloroethene	ug/L	ND	1.0	11/21/15 11:45	
cis-1,3-Dichloropropene	ug/L	ND	1.0	11/21/15 11:45	
Dibromochloromethane	ug/L	ND	1.0	11/21/15 11:45	
Dibromomethane	ug/L	ND	1.0	11/21/15 11:45	
Ethylbenzene	ug/L	ND	1.0	11/21/15 11:45	
Iodomethane	ug/L	ND	5.0	11/21/15 11:45	
Methylene Chloride	ug/L	ND	1.0	11/21/15 11:45	
Styrene	ug/L	ND	1.0	11/21/15 11:45	
Tetrachloroethene	ug/L	ND	1.0	11/21/15 11:45	
Toluene	ug/L	ND	1.0	11/21/15 11:45	
trans-1,2-Dichloroethene	ug/L	ND	1.0	11/21/15 11:45	
trans-1,3-Dichloropropene	ug/L	ND	1.0	11/21/15 11:45	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	11/21/15 11:45	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

METHOD BLANK: 1612653 Matrix: Water

Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007, 92277031008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	11/21/15 11:45	
Trichlorofluoromethane	ug/L	ND	1.0	11/21/15 11:45	
Vinyl acetate	ug/L	ND	2.0	11/21/15 11:45	
Vinyl chloride	ug/L	ND	1.0	11/21/15 11:45	
Xylene (Total)	ug/L	ND	2.0	11/21/15 11:45	
1,2-Dichloroethane-d4 (S)	%	100	70-130	11/21/15 11:45	
4-Bromofluorobenzene (S)	%	105	70-130	11/21/15 11:45	
Toluene-d8 (S)	%	99	70-130	11/21/15 11:45	

LABORATORY CONTROL SAMPLE: 1612654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	46.1	92	80-125	
1,1,1-Trichloroethane	ug/L	50	49.0	98	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	43.2	86	79-124	
1,1,2-Trichloroethane	ug/L	50	49.6	99	85-125	
1,1-Dichloroethane	ug/L	50	49.0	98	73-126	
1,1-Dichloroethene	ug/L	50	54.2	108	66-135	
1,2,3-Trichloropropane	ug/L	50	47.9	96	75-130	
1,2-Dichlorobenzene	ug/L	50	46.7	93	80-133	
1,2-Dichloroethane	ug/L	50	47.2	94	67-128	
1,2-Dichloropropane	ug/L	50	46.8	94	75-132	
1,4-Dichlorobenzene	ug/L	50	46.8	94	78-130	
2-Butanone (MEK)	ug/L	100	105	105	61-144	
2-Hexanone	ug/L	100	90.2	90	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	102	102	72-135	
Acetone	ug/L	100	107	107	48-146	
Acrylonitrile	ug/L	250	254	102	40-160	
Benzene	ug/L	50	50.1	100	80-125	
Bromochloromethane	ug/L	50	51.3	103	71-125	
Bromodichloromethane	ug/L	50	45.7	91	78-124	
Bromoform	ug/L	50	39.9	80	71-128	
Bromomethane	ug/L	50	49.3	99	40-160	
Carbon disulfide	ug/L	50	53.3	107	50-160	
Carbon tetrachloride	ug/L	50	51.5	103	69-131	
Chlorobenzene	ug/L	50	45.5	91	81-122	
Chloroethane	ug/L	50	53.6	107	39-148	
Chloroform	ug/L	50	50.8	102	73-127	
Chloromethane	ug/L	50	51.7	103	44-146	
cis-1,2-Dichloroethene	ug/L	50	51.2	102	74-124	
cis-1,3-Dichloropropene	ug/L	50	47.8	96	72-132	
Dibromochloromethane	ug/L	50	44.4	89	78-125	
Dibromomethane	ug/L	50	52.5	105	82-120	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

LABORATORY CONTROL SAMPLE: 1612654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	45.1	90	79-121	
Iodomethane	ug/L	100	102	102	39-154	
Methylene Chloride	ug/L	50	51.5	103	64-133	
Styrene	ug/L	50	46.5	93	84-126	
Tetrachloroethene	ug/L	50	48.4	97	78-122	
Toluene	ug/L	50	48.0	96	80-121	
trans-1,2-Dichloroethene	ug/L	50	54.0	108	71-127	
trans-1,3-Dichloropropene	ug/L	50	46.2	92	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	36.9	74	40-160	
Trichloroethene	ug/L	50	49.7	99	78-122	
Trichlorofluoromethane	ug/L	50	53.1	106	53-137	
Vinyl acetate	ug/L	100	97.7	98	40-160	
Vinyl chloride	ug/L	50	60.1	120	58-137	
Xylene (Total)	ug/L	150	135	90	81-126	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			107	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE SAMPLE: 1612655

Parameter	Units	92277056001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.4	97	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.5	113	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.1	91	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.1	106	70-130	
1,1-Dichloroethane	ug/L	20.7	20	43.5	114	70-130	
1,1-Dichloroethene	ug/L	ND	20	25.1	124	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.4	97	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	20.2	100	70-130	
1,2-Dichloroethane	ug/L	0.86J	20	22.4	108	70-130	
1,2-Dichloropropane	ug/L	4.3	20	24.5	101	70-130	
1,4-Dichlorobenzene	ug/L	4.8	20	25.5	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.0	113	70-130	
2-Hexanone	ug/L	ND	40	38.7	97	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	44.4	111	70-130	
Acetone	ug/L	ND	40	43.1	108	70-130	
Acrylonitrile	ug/L	ND	100	109	109	70-130	
Benzene	ug/L	6.0	20	28.9	114	70-148	
Bromochloromethane	ug/L	ND	20	22.9	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.1	101	70-130	
Bromoform	ug/L	ND	20	16.3	82	70-130	
Bromomethane	ug/L	ND	20	19.5	97	70-130	
Carbon disulfide	ug/L	ND	20	24.0	120	70-130	
Carbon tetrachloride	ug/L	ND	20	23.4	117	70-130	
Chlorobenzene	ug/L	0.31J	20	20.2	99	70-146	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

MATRIX SPIKE SAMPLE: 1612655

Parameter	Units	92277056001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	23.8	119	70-130	
Chloroform	ug/L	ND	20	23.0	115	70-130	
Chloromethane	ug/L	ND	20	22.5	113	70-130	
cis-1,2-Dichloroethene	ug/L	44.4	20	68.1	119	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.3	101	70-130	
Dibromochloromethane	ug/L	ND	20	18.8	94	70-130	
Dibromomethane	ug/L	ND	20	22.4	112	70-130	
Ethylbenzene	ug/L	ND	20	19.9	100	70-130	
Iodomethane	ug/L	ND	40	38.1	95	70-130	
Methylene Chloride	ug/L	ND	20	24.3	122	70-130	
Styrene	ug/L	ND	20	19.8	99	70-130	
Tetrachloroethene	ug/L	0.90J	20	21.9	105	70-130	
Toluene	ug/L	ND	20	21.8	109	70-155	
trans-1,2-Dichloroethene	ug/L	1.5J	20	26.0	123	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	20.0	100	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	13.1	65	70-130	M1
Trichloroethene	ug/L	4.7	20	27.1	112	69-151	
Trichlorofluoromethane	ug/L	0.41J	20	25.3	124	70-130	
Vinyl acetate	ug/L	ND	40	37.4	93	70-130	
Vinyl chloride	ug/L	7.7	20	35.0	137	70-130	M1
1,2-Dichloroethane-d4 (S)	%				100	70-130	
4-Bromofluorobenzene (S)	%				105	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 1612656

Parameter	Units	92277056002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	0.82J	.85J		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	0.40J	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	1.4	1.2	11	30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

SAMPLE DUPLICATE: 1612656

Parameter	Units	92277056002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	0.81J	.81J		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	5.6	5.3	4	30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	2.0	1.9	2	30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	101	1		
4-Bromofluorobenzene (S)	%	105	105	0		
Toluene-d8 (S)	%	101	100	1		

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: WET/41556 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 1612805 Matrix: Water
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	11/22/15 10:47	

LABORATORY CONTROL SAMPLE: 1612806

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	252	101	90-110	

SAMPLE DUPLICATE: 1612807

Parameter	Units	92276571001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1470	1260	15	5	D6

SAMPLE DUPLICATE: 1612808

Parameter	Units	92277031004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	27.0	ND		5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: SW-2 **Lab ID: 92277031001** Collected: 11/18/15 10:10 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.172 ± 0.571 (0.960) C:NA T:63%**	pCi/L	11/30/15 12:26	13982-63-3	
Radium-228	EPA 904.0	**0.391 ± 0.370 (0.753) C:80% T:72%**	pCi/L	11/30/15 18:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: SW-1 **Lab ID: 92277031002** Collected: 11/18/15 10:50 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.147 ± 0.407 (0.789)** **C:NA T:82%**	pCi/L	11/30/15 12:32	13982-63-3	
Radium-228	EPA 904.0	**1.94 ± 0.555 (0.638)** **C:85% T:83%**	pCi/L	11/30/15 18:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: BG-1 **Lab ID: 92277031003** Collected: 11/18/15 13:10 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.800 ± 0.736 (0.434)** **C:NA T:91%**	pCi/L	11/30/15 11:50	13982-63-3	
Radium-228	EPA 904.0	**1.29 ± 0.542 (0.863)** **C:85% T:75%**	pCi/L	11/30/15 18:49	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: LEACHATE-1 **Lab ID: 92277031004** Collected: 11/18/15 14:30 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.137 ± 0.501 (0.963)** **C:NA T:91%**	pCi/L	11/30/15 11:57	13982-63-3	
Radium-228	EPA 904.0	**0.0712 ± 0.265 (0.601)** **C:85% T:86%**	pCi/L	11/30/15 18:49	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: MW-5 **Lab ID: 92277031005** Collected: 11/18/15 16:25 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.592 ± 0.470 (0.611)** **C:NA T:94%**	pCi/L	11/30/15 12:47	13982-63-3	
Radium-228	EPA 904.0	**0.359 ± 0.312 (0.626)** **C:86% T:86%**	pCi/L	11/30/15 19:09	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277031006** Collected: 11/18/15 17:00 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.306 (0.622)** **C:NA T:102%**	pCi/L	11/30/15 12:47	13982-63-3	
Radium-228	EPA 904.0	**0.514 ± 0.335 (0.639)** **C:83% T:91%**	pCi/L	11/30/15 18:48	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Sample: EQUIPMENT BLANK **Lab ID: 92277031007** Collected: 11/18/15 17:15 Received: 11/18/15 18:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0683 ± 0.312 (0.185) C:NA T:89%**	pCi/L	11/30/15 12:38	13982-63-3	
Radium-228	EPA 904.0	**0.227 ± 0.322 (0.692) C:83% T:81%**	pCi/L	11/30/15 18:49	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: RADC/26980 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 988719 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.310 (0.696) C:NA T:100%	pCi/L	11/30/15 12:01	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

QC Batch: RADC/26983 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92277031001, 92277031002, 92277031003, 92277031004, 92277031005, 92277031006, 92277031007

METHOD BLANK: 988722 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.714 ± 0.326 (0.547) C:87% T:96%	pCi/L	11/30/15 18:48	

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QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

C9	Common Laboratory Contaminant.
D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M2	Matrix spike recovery was below QC limits due to sample dilution. Data acceptance based on laboratory control sample (LCS) recovery.

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QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

ANALYTE QUALIFIERS

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92277031001	**SW-2**	EPA 300.0	GWD/2690		
92277031002	**SW-1**	EPA 300.0	GWD/2690		
92277031003	**BG-1**	EPA 300.0	GWD/2690		
92277031004	**LEACHATE-1**	EPA 300.0	GWD/2690		
92277031005	**MW-5**	EPA 300.0	GWD/2690		
92277031006	**AMBIENT/FIELD BLANK**	EPA 300.0	GWD/2690		
92277031007	**EQUIPMENT BLANK**	EPA 300.0	GWD/2690		
92277031001	**SW-2**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031002	**SW-1**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031003	**BG-1**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031004	**LEACHATE-1**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031005	**MW-5**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031006	**AMBIENT/FIELD BLANK**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031007	**EQUIPMENT BLANK**	EPA 3010	MPRP/20100	EPA 6010	ICP/18129
92277031001	**SW-2**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031002	**SW-1**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031003	**BG-1**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031004	**LEACHATE-1**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031005	**MW-5**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031006	**AMBIENT/FIELD BLANK**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031007	**EQUIPMENT BLANK**	EPA 3020	MPRP/59874	EPA 6020	ICPM/27627
92277031001	**SW-2**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031002	**SW-1**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031003	**BG-1**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031004	**LEACHATE-1**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031005	**MW-5**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031006	**AMBIENT/FIELD BLANK**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031007	**EQUIPMENT BLANK**	EPA 7470	MERP/8693	EPA 7470	MERC/8352
92277031001	**SW-2**	EPA 8260	MSV/34379		
92277031002	**SW-1**	EPA 8260	MSV/34379		
92277031003	**BG-1**	EPA 8260	MSV/34379		
92277031004	**LEACHATE-1**	EPA 8260	MSV/34379		
92277031005	**MW-5**	EPA 8260	MSV/34379		
92277031006	**AMBIENT/FIELD BLANK**	EPA 8260	MSV/34379		
92277031007	**EQUIPMENT BLANK**	EPA 8260	MSV/34379		
92277031008	**TRIP BLANK**	EPA 8260	MSV/34379		
92277031001	**SW-2**	EPA 903.1	RADC/26980		
92277031002	**SW-1**	EPA 903.1	RADC/26980		
92277031003	**BG-1**	EPA 903.1	RADC/26980		
92277031004	**LEACHATE-1**	EPA 903.1	RADC/26980		
92277031005	**MW-5**	EPA 903.1	RADC/26980		
92277031006	**AMBIENT/FIELD BLANK**	EPA 903.1	RADC/26980		
92277031007	**EQUIPMENT BLANK**	EPA 903.1	RADC/26980		
92277031001	**SW-2**	EPA 904.0	RADC/26983		
92277031002	**SW-1**	EPA 904.0	RADC/26983		
92277031003	**BG-1**	EPA 904.0	RADC/26983		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277031

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92277031004	**LEACHATE-1**	EPA 904.0	RADC/26983		
92277031005	**MW-5**	EPA 904.0	RADC/26983		
92277031006	**AMBIENT/FIELD BLANK**	EPA 904.0	RADC/26983		
92277031007	**EQUIPMENT BLANK**	EPA 904.0	RADC/26983		
92277031001	**SW-2**	SM 2540C	WET/41556		
92277031002	**SW-1**	SM 2540C	WET/41556		
92277031003	**BG-1**	SM 2540C	WET/41556		
92277031004	**LEACHATE-1**	SM 2540C	WET/41556		
92277031005	**MW-5**	SM 2540C	WET/41556		
92277031006	**AMBIENT/FIELD BLANK**	SM 2540C	WET/41556		
92277031007	**EQUIPMENT BLANK**	SM 2540C	WET/41556		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: November 17, 2015 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16.1**	Issuing Authority: Pace Huntersville Quality Office

Client Name: Chen

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1505 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Temp Correction Factor No Correction

Corrected Cooler Temp.: 4.0 °C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: VMD

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WI		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☑Yes ☐No ☐N/A	16.
Trip Blank Custody Seals Present	☑Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:	SB	**Date:**	11/20/15
SRF Review:	JD	**Date:**	11/21/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92277031

92277031

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1820970

Section A Required Client Information:

Company: Cherokee - Brickhaven
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name: Cherokee - Brickhaven
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	Metals	VOC 8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92277031
1	SW-2		G			11/18/15	1010		11									3	2	3	1	1	1		001
2	SW-1		G			11/18/15	1050		11									3	2	3	1	1	1		002
3	BG-1		G			11/18/15	1310		11									3	2	3	1	1	1		003
4	Leachate-1		G			11/18/15	1430		11									3	2	3	1	1	1		004
5	MW-5		G			11/18/15	1625		11									3	2	3	1	1	1		005
6																									—
7	Ambient / Field Blank		G			11/18/15	1700		11									3	2	3	1	1	1		006
8	Equipment Blank		G			11/18/15	1715		11									3	2	3	1	1	1		007
9	Trip Blank		G			11/18/15			2											2					008
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	11/18/15	1830	J Moore / PACE	11/18/15	1830	4.6	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 11/18/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Chevron - Brickhaven (HDR) Location: Moncure, NC Project Name/#: Chevron - Brickhaven

Name and Afiliation (Sampler(s)): C.S. S.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-5 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 46.96 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 14.75 ft Casing Volume: 5.25023 gallons

Height of Water Column: 32.21 ft Cal. 3 Volumes: 15.75069 gallons

Purge Information

Date Purged: 11 / 18 / 15 Start Time: 1500 Finish: 1625 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 8500 ml ~~gallons~~

Sampling Information

Date Collected: 11/18/15 Time Collected: 1625 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3
		metals x2, VOCx3 (8260),
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 20.3 Time: 1625 Turbidity (ntu): 8.08 Time: 1625

Sample pH (s.u.): 7.11 Time: Diss Oxy (mg/L): 1.09 Time: 1625

Specific Cond. (uS): 491.7 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 157.1 Time: Other: Turb. 0.0ms/L Time: 1625

Odor: None Time: Appearance: Clear

General/Weather Observations

Well near black fence. Just outside water storage tanks.

Sampler Signature/Date: [signature] 11/18/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1505	7.13	499.6	178.7	20.31	1.44	20.8	500ml	15.30ft
1510	7.14	499.6	177.3	15.09	1.50	21.4	1000ml	15.75ft
1515	7.14	499.4	175.8	21.17	1.36	21.7	1500ml	15.95ft
1520	7.14	499.3	173.5	16.43	1.56	21.6	2000ml	16.0ft
1525	7.13	496.5	172.8	23.00	1.59	21.8	2500ml	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR Chevron / Brickhaven

Location: Moncure, NC

Project: Chevron - Brickhaven

Well ID: MW-5

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1530	7.13	496.5	172.8	20.61	1.55	21.7	3000mL	17.00
1535	7.12	497.4	171.2	19.50	1.55	21.6	3500mL	17.00
1545	7.13	497.4	169.2	19.12	1.40	21.8	4500mL	17.50
1555	7.13	498.3	165.3	15.25	1.08	20.5	5500mL	18.00
1605	7.13	496.1	162.7	14.17	1.08	20.2	6500mL	18.50
1615	7.12	493.3	160.4	12.74	1.10	20.3	7500mL	19.00
1625	7.11	491.7	157.1	8.08	1.09	20.3	8500mL	19.50 ft

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Charrah - Brickhaven HDR Location: Moncure, NC Project Name/#: Charrah/Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: Leachate 1 Well Locked: YES NO CS 11/18/15

Well Diameter: _____ Construction: PVC Steel Stainless Steel CS 11/18/15

Total Well Depth: _____ ft Multi Factor*: 0.16 CS 11/18/15 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ____/____/____ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 11/18/15 Time Collected: 1430 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		metals x2, VOC x3 (8260)
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 22.9 Time: 1430 Turbidity (ntu): 6.38 Time: 1430

Sample pH (s.u.): 7.28 Time: | Diss Oxy (mg/L): 4.25 Time: 1430

Specific Cond. (uS): 81.7 Time: | Res. Cl (mg/L): — Time: —

ReDox (mV): 199.6 Time: | Other: Iron: 0.0 mg/L Time: 1430

Odor: None Time: — Appearance: Clear

General/Weather Observations

Inside Barrier near large water storage tanks. Yellow valve handle

Sampler Signature/Date: [signature] 11/18/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Charah - Brickhaven Location: Mancure, NC Project Name/#: Charah / Brickhaven

Name and Afiliation (Sampler(s)): C.S, J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: BG-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.78 ft Multi Factor*: .16.30 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 11.36 ft Casing Volume: 5.28446 gallons

Height of Water Column: 32.42 ft Cal. 3 Volumes: 15.85338 gallons

Purge Information

Date Purged: 11 / 18 / 15 Start Time: 1235 Finish: 1310 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 3500 ml ~~gallons~~

Sampling Information

Date Collected: 11/18/15 Time Collected: 1310 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		Metals x2, VOCs x3 (8260)
		TDS, Fluoride,
		Chloride, Sulfate

Field Measurements/Observations

Sample Temp (°C): 19.2 Time: 1310

Sample pH (s.u.): 6.38 Time: |

Specific Cond. (uS): 1238 Time: |

ReDox (mV): 298.2 Time: |

Odor: None Time: |

Turbidity (ntu): ~~1310~~ 4.67 ntu CS 11/18/15 Time: 1310

Diss Oxy (mg/L): 1.67 Time: 1310

Res. Cl (mg/L): — Time: —

Other: Iron: 0.0 mg/L Time: 1310

Appearance: Clear

General/Weather Observations

Near Front gate. OK recharge

Sampler Signature/Date: Chris Sowell / 11/18/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level (ft)
1240	6.33	1221	231.0	4.14	2.40	18.7	500ml	12 ft
1245	6.36	1216	249.9	3.55	2.17	19.1	1000ml	12 ft
1250	6.38	1229	265.1	3.98	1.98	19.3	1500ml	Stable
1255	6.39	1235	287.5	3.82	1.88	19.4	2000ml	Stable
1300	6.39	1237	294.5	4.45	1.69	19.2	2500ml	Stable

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

HDR

Client: Charrah-Brickhaven

Location: Monroe, NC

Project: Charrah - Brickhaven

Well ID: BG-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1305	6.38	1239	297.0	5.21	1.68	19.2	3000ml	12 ft
1310	6.38	1238	298.2	4.67	1.67	19.2	3500ml	stable

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

HDR

Field Data Sheet

Client: Cherokee Brickhaven Location: Mercure NC Project Name/#: Cherokee Brickhaven

Name and Afiliation (Sampler(s)): C.S, J.A / PACE

Name and Afiliation (Inspector): ____

Well Information

Well ID: SW-1 Well Locked: YES NO

Well Diameter: ____ Construction: PVC Steel Stainless Steel

Total Well Depth: ____ ft Multi Factor*: ____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ____ ft Casing Volume: ____ gallons

Height of Water Column: ____ ft Cal. 3 Volumes: ____ gallons

Purge Information

Date Purged: ____/____/____ Start Time: ____ Finish: ____ Purge Rate: ____

Purging Method: ____ Total Volume Purged: ____ gallons

Sampling Information

Date Collected: 11/18/15 Time Collected: 1050 am ~~pm~~

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		Metals x2, VOC x3 (8260)
		TDS, Fluoride
		Chloride, Sulfate

Field Measurements/Observations

Sample Temp (°C): 12.3 Time: 1050 Turbidity (ntu): 352.0 Time: 1050

Sample pH (s.u.): 6.23 Time: ____ Diss Oxy (mg/L): 6.35 Time: 1050

Specific Cond. (uS): 71.0 Time: ____ Res. Cl (mg/L): — Time: —

ReDox (mV): 171.2 Time: ____ Other: Iron, 0.0 mg/L Time: 1050

Odor: None Time: ____ Appearance: Orange

General/Weather Observations

Orange (floc) water. Weeds directly on side of road.

Sampler Signature/Date: Clint Bowell / 11/18/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Cherrah - Brickhaven HDR Location: ~~Eden, NC~~ CS 11/18/15 Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-2 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ft Casing Volume: _____ gallons

Height of Water Column: _____ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ____/____/____ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 11/18/15 Time Collected: 1010 am ~~pm~~ R

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x 3
		metals x 2 UOC x 3 (8260)
		TDS Fluoride
		Chloride, Sulfate

Field Measurements/Observations

Sample Temp (°C): 11.8 Time: 1010 Turbidity (ntu): 17.66 Time: 1010

Sample pH (s.u.): 6.05 Time: Diss Oxy (mg/L): 1.33 Time: 1010

Specific Cond. (uS): 118.4 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 163.0 Time: Other: Iron 0.0 mg/L Time: 1010

Odor: None Time: Appearance: Orange

General/Weather Observations

Area more ~~not~~ inundated by water (flooded) than previous sample event. 11/18/15

Sampler Signature/Date: [signature] / 11/18/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

December 11, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on November 20, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Charlotte Certification IDs
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92277140001	**MW-2**	Water	11/19/15 11:00	11/20/15 09:06
92277140002	**MW-3**	Water	11/19/15 13:15	11/20/15 09:06
92277140003	**MW-4**	Water	11/19/15 15:10	11/20/15 09:06
92277140004	**MW-4 FIELD DUPLICATE**	Water	11/19/15 16:00	11/20/15 09:06
92277140005	**AMBIENT/FIELD BLANK**	Water	11/19/15 16:20	11/20/15 09:06
92277140006	**EQUIPMENT BLANK**	Water	11/19/15 16:30	11/20/15 09:06
92277140007	**TRIP BLANK**	Water	11/19/15 00:00	11/20/15 09:06

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92277140001	**MW-2**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	16	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277140002	**MW-3**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277140003	**MW-4**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277140004	**MW-4 FIELD DUPLICATE**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277140005	**AMBIENT/FIELD BLANK**	EPA 300.0	CDC	3	PASI-G

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SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277140006	**EQUIPMENT BLANK**	EPA 300.0	CDC	3	PASI-G
		EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277140007	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277140001	**MW-2**					
EPA 300.0	Chloride	1050	mg/L	20.0	11/25/15 07:58	
EPA 300.0	Fluoride	0.30	mg/L	0.10	11/24/15 17:40	
EPA 300.0	Sulfate	238	mg/L	5.0	11/25/15 06:38	
EPA 6010	Antimony	9.3	ug/L	5.0	11/30/15 18:06	
EPA 6010	Barium	306	ug/L	5.0	11/30/15 18:06	
EPA 6010	Chromium	7.2	ug/L	5.0	11/30/15 18:06	
EPA 6010	Molybdenum	21.1	ug/L	5.0	11/30/15 18:06	
EPA 6010	Zinc	50.7	ug/L	10.0	11/30/15 18:06	
EPA 6020	Boron	40.9	ug/L	25.0	12/04/15 10:16	
EPA 6020	Lithium	53.1	ug/L	2.5	12/04/15 10:16	
EPA 903.1	Radium-226	0.985 ± 0.563 (0.518) C:NA T:86%	pCi/L		11/30/15 13:05	
EPA 904.0	Radium-228	1.75 ± 0.521 (0.623) C:84% T:84%	pCi/L		11/30/15 18:49	
SM 2540C	Total Dissolved Solids	257	mg/L	25.0	11/24/15 18:35	
92277140002	**MW-3**					
EPA 300.0	Chloride	1230	mg/L	20.0	11/25/15 08:28	
EPA 300.0	Fluoride	0.22	mg/L	0.10	11/24/15 18:53	
EPA 300.0	Sulfate	12.3	mg/L	1.0	11/24/15 18:53	
EPA 6010	Antimony	10.1	ug/L	5.0	11/30/15 18:09	
EPA 6010	Barium	718	ug/L	5.0	11/30/15 18:09	
EPA 6010	Calcium	157000	ug/L	1000	12/01/15 18:03	
EPA 6010	Molybdenum	10.4	ug/L	5.0	11/30/15 18:09	
EPA 6020	Boron	49.4	ug/L	25.0	12/04/15 10:19	
EPA 6020	Lithium	128	ug/L	2.5	12/04/15 10:19	
EPA 903.1	Radium-226	0.816 ± 0.574 (0.732) C:NA T:92%	pCi/L		11/30/15 13:06	
EPA 904.0	Radium-228	1.95 ± 0.550 (0.617) C:83% T:89%	pCi/L		11/30/15 18:49	
SM 2540C	Total Dissolved Solids	256	mg/L	25.0	11/24/15 18:35	
92277140003	**MW-4**					
EPA 300.0	Chloride	294	mg/L	6.0	11/25/15 08:58	
EPA 300.0	Fluoride	0.34	mg/L	0.10	11/24/15 19:18	
EPA 300.0	Sulfate	5.9	mg/L	1.0	11/24/15 19:18	
EPA 6010	Barium	191	ug/L	5.0	11/30/15 18:22	
EPA 6010	Calcium	39200	ug/L	100	11/30/15 18:22	
EPA 6020	Boron	6.2	ug/L	5.0	12/04/15 10:04	
EPA 6020	Lithium	20.0	ug/L	0.50	12/04/15 10:04	

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SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277140003	**MW-4**					
EPA 903.1	Radium-226	0.406 ± 0.378 (0.498) C:NA T:97%	pCi/L		11/30/15 12:50	
EPA 904.0	Radium-228	0.174 ± 0.306 (0.669) C:82% T:89%	pCi/L		11/30/15 18:49	
SM 2540C	Total Dissolved Solids	395	mg/L	25.0	11/24/15 18:36	
92277140004	**MW-4 FIELD DUPLICATE**					
EPA 300.0	Chloride	287	mg/L	6.0	11/25/15 09:29	
EPA 300.0	Fluoride	0.34	mg/L	0.10	11/24/15 19:42	
EPA 300.0	Sulfate	6.0	mg/L	1.0	11/24/15 19:42	
EPA 6010	Barium	178	ug/L	5.0	11/30/15 18:25	
EPA 6010	Calcium	38400	ug/L	100	11/30/15 18:25	
EPA 6020	Boron	7.0	ug/L	5.0	12/04/15 10:22	
EPA 6020	Lithium	22.4	ug/L	0.50	12/04/15 10:22	
EPA 903.1	Radium-226	0.620 ± 0.640 (0.972) C:NA T:89%	pCi/L		11/30/15 12:51	
EPA 904.0	Radium-228	0.303 ± 0.287 (0.586) C:86% T:90%	pCi/L		11/30/15 19:05	
SM 2540C	Total Dissolved Solids	369	mg/L	25.0	11/24/15 18:37	
92277140005	**AMBIENT/FIELD BLANK**					
EPA 903.1	Radium-226	0.143 ± 0.445 (0.861) C:NA T:94%	pCi/L		11/30/15 13:18	
EPA 904.0	Radium-228	0.298 ± 0.289 (0.592) C:82% T:93%	pCi/L		11/30/15 19:05	
92277140006	**EQUIPMENT BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.268 (0.546) C:NA T:108%	pCi/L		11/30/15 13:18	
EPA 904.0	Radium-228	0.589 ± 0.330 (0.583) C:83% T:82%	pCi/L		11/30/15 19:05	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-2 **Lab ID: 92277140001** Collected: 11/19/15 11:00 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1050**	mg/L	20.0	20		11/25/15 07:58	16887-00-6	
Fluoride	**0.30**	mg/L	0.10	1		11/24/15 17:40	16984-48-8	
Sulfate	**238**	mg/L	5.0	5		11/25/15 06:38	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**9.3**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:06	7440-38-2	
Barium	**306**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:06	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:06	7440-43-9	
Chromium	**7.2**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7439-92-1	
Molybdenum	**21.1**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:06	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 17:57	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:06	7440-62-2	
Zinc	**50.7**	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:06	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**40.9**	ug/L	25.0	5	12/03/15 15:41	12/04/15 10:16	7440-42-8	
Lithium	**53.1**	ug/L	2.5	5	12/03/15 15:41	12/04/15 10:16	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/30/15 17:30	12/01/15 12:31	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 18:17	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 18:17	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 18:17	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 18:17	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 18:17	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 18:17	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 18:17	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 18:17	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 18:17	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 18:17	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 18:17	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 18:17	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 18:17	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 18:17	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 18:17	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/21/15 18:17	74-95-3	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-2 **Lab ID: 92277140001** Collected: 11/19/15 11:00 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 18:17	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 18:17	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 18:17	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 18:17	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 18:17	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 18:17	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 18:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 18:17	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 18:17	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 18:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 18:17	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 18:17	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 18:17	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 18:17	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 18:17	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 18:17	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 18:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 18:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 18:17	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 18:17	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 18:17	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 18:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 18:17	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 18:17	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 18:17	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 18:17	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 18:17	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 18:17	75-01-4	M1
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 18:17	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		11/21/15 18:17	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		11/21/15 18:17	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 18:17	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**257**	mg/L	25.0	1		11/24/15 18:35		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-3 **Lab ID: 92277140002** Collected: 11/19/15 13:15 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1230**	mg/L	20.0	20		11/25/15 08:28	16887-00-6	
Fluoride	**0.22**	mg/L	0.10	1		11/24/15 18:53	16984-48-8	
Sulfate	**12.3**	mg/L	1.0	1		11/24/15 18:53	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**10.1**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:09	7440-38-2	
Barium	**718**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:09	7440-43-9	
Calcium	**157000**	ug/L	1000	10	11/25/15 22:00	12/01/15 18:03	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7439-92-1	
Molybdenum	**10.4**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:09	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:00	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:09	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:09	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**49.4**	ug/L	25.0	5	12/03/15 15:41	12/04/15 10:19	7440-42-8	
Lithium	**128**	ug/L	2.5	5	12/03/15 15:41	12/04/15 10:19	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/30/15 17:30	12/01/15 12:38	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 18:34	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 18:34	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 18:34	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 18:34	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 18:34	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 18:34	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 18:34	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 18:34	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 18:34	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 18:34	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 18:34	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 18:34	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 18:34	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 18:34	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 18:34	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-3 **Lab ID: 92277140002** Collected: 11/19/15 13:15 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 18:34	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 18:34	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 18:34	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 18:34	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 18:34	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 18:34	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 18:34	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 18:34	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 18:34	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 18:34	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 18:34	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 18:34	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 18:34	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 18:34	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 18:34	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 18:34	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 18:34	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 18:34	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 18:34	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 18:34	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 18:34	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 18:34	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 18:34	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 18:34	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 18:34	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 18:34	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 18:34	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 18:34	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 18:34	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 18:34	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		11/21/15 18:34	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		11/21/15 18:34	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		11/21/15 18:34	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**256**	mg/L	25.0	1		11/24/15 18:35		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-4 **Lab ID: 92277140003** Collected: 11/19/15 15:10 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**294**	mg/L	6.0	6		11/25/15 08:58	16887-00-6	
Fluoride	**0.34**	mg/L	0.10	1		11/24/15 19:18	16984-48-8	
Sulfate	**5.9**	mg/L	1.0	1		11/24/15 19:18	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:22	7440-38-2	
Barium	**191**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:22	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:22	7440-43-9	
Calcium	**39200**	ug/L	100	1	11/25/15 22:00	11/30/15 18:22	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:22	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:16	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:22	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:22	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**6.2**	ug/L	5.0	1	12/03/15 15:41	12/04/15 10:04	7440-42-8	
Lithium	**20.0**	ug/L	0.50	1	12/03/15 15:41	12/04/15 10:04	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/30/15 17:30	12/01/15 12:40	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 19:08	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 19:08	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 19:08	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 19:08	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 19:08	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 19:08	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 19:08	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 19:08	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 19:08	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 19:08	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 19:08	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 19:08	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 19:08	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 19:08	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 19:08	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-4 **Lab ID: 92277140003** Collected: 11/19/15 15:10 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 19:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:08	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:08	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 19:08	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:08	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 19:08	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:08	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 19:08	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 19:08	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 19:08	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 19:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 19:08	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 19:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:08	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 19:08	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 19:08	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:08	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 19:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 19:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 19:08	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 19:08	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 19:08	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 19:08	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		11/21/15 19:08	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		11/21/15 19:08	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 19:08	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**395**	mg/L	25.0	1		11/24/15 18:36		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-4 FIELD DUPLICATE **Lab ID: 92277140004** Collected: 11/19/15 16:00 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**287**	mg/L	6.0	6		11/25/15 09:29	16887-00-6	
Fluoride	**0.34**	mg/L	0.10	1		11/24/15 19:42	16984-48-8	
Sulfate	**6.0**	mg/L	1.0	1		11/24/15 19:42	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:25	7440-38-2	
Barium	**178**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:25	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:25	7440-43-9	
Calcium	**38400**	ug/L	100	1	11/25/15 22:00	11/30/15 18:25	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:25	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:19	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:25	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:25	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**7.0**	ug/L	5.0	1	12/03/15 15:41	12/04/15 10:22	7440-42-8	
Lithium	**22.4**	ug/L	0.50	1	12/03/15 15:41	12/04/15 10:22	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/30/15 17:30	12/01/15 12:42	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 19:25	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 19:25	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 19:25	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 19:25	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 19:25	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 19:25	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 19:25	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 19:25	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 19:25	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 19:25	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 19:25	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 19:25	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 19:25	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 19:25	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 19:25	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-4 FIELD DUPLICATE **Lab ID: 92277140004** Collected: 11/19/15 16:00 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 19:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:25	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:25	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 19:25	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 19:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:25	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 19:25	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 19:25	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 19:25	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 19:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 19:25	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 19:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:25	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 19:25	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 19:25	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:25	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 19:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 19:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 19:25	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 19:25	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 19:25	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 19:25	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/21/15 19:25	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		11/21/15 19:25	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 19:25	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**369**	mg/L	25.0	1		11/24/15 18:37		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277140005** Collected: 11/19/15 16:20 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		11/24/15 20:55	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 20:55	16984-48-8	
Sulfate	ND	mg/L	1.0	1		11/24/15 20:55	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:28	7440-38-2	
Barium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:28	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:28	7440-43-9	
Calcium	ND	ug/L	100	1	11/25/15 22:00	11/30/15 18:28	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:28	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:22	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:28	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:28	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	12/03/15 15:41	12/04/15 09:51	7440-42-8	
Lithium	ND	ug/L	0.50	1	12/03/15 15:41	12/04/15 09:51	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/30/15 17:30	12/01/15 12:45	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 19:42	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 19:42	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 19:42	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 19:42	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 19:42	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 19:42	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 19:42	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 19:42	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 19:42	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 19:42	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 19:42	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 19:42	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 19:42	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 19:42	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 19:42	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277140005** Collected: 11/19/15 16:20 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 19:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:42	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:42	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 19:42	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:42	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 19:42	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:42	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 19:42	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 19:42	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 19:42	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 19:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 19:42	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 19:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:42	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 19:42	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 19:42	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:42	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 19:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 19:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 19:42	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 19:42	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 19:42	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 19:42	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/21/15 19:42	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		11/21/15 19:42	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 19:42	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		11/24/15 18:37		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: EQUIPMENT BLANK **Lab ID: 92277140006** Collected: 11/19/15 16:30 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		11/24/15 21:20	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/24/15 21:20	16984-48-8	
Sulfate	ND	mg/L	1.0	1		11/24/15 21:20	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:31	7440-38-2	
Barium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:31	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:31	7440-43-9	
Calcium	ND	ug/L	100	1	11/25/15 22:00	11/30/15 18:31	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:31	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:25	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:31	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:31	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	12/03/15 15:41	12/04/15 09:53	7440-42-8	
Lithium	ND	ug/L	0.50	1	12/03/15 15:41	12/04/15 09:53	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	11/30/15 17:30	12/01/15 12:47	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 19:59	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 19:59	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 19:59	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 19:59	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 19:59	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 19:59	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 19:59	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 19:59	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 19:59	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 19:59	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 19:59	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 19:59	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 19:59	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 19:59	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 19:59	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: EQUIPMENT BLANK **Lab ID: 92277140006** Collected: 11/19/15 16:30 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		11/21/15 19:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:59	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 19:59	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 19:59	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:59	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 19:59	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 19:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 19:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 19:59	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 19:59	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 19:59	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 19:59	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 19:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 19:59	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 19:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 19:59	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 19:59	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 19:59	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 19:59	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 19:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 19:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 19:59	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 19:59	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 19:59	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 19:59	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/21/15 19:59	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		11/21/15 19:59	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		11/21/15 19:59	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		11/24/15 18:37		

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: TRIP BLANK **Lab ID: 92277140007** Collected: 11/19/15 00:00 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/21/15 20:16	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/21/15 20:16	107-13-1	
Benzene	ND	ug/L	1.0	1		11/21/15 20:16	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/21/15 20:16	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/21/15 20:16	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/21/15 20:16	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/21/15 20:16	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/21/15 20:16	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/21/15 20:16	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/21/15 20:16	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/21/15 20:16	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/21/15 20:16	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/21/15 20:16	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/21/15 20:16	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/21/15 20:16	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/21/15 20:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 20:16	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/21/15 20:16	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/21/15 20:16	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/21/15 20:16	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/21/15 20:16	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/21/15 20:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 20:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/21/15 20:16	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/21/15 20:16	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 20:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/21/15 20:16	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/21/15 20:16	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/21/15 20:16	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/21/15 20:16	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/21/15 20:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/21/15 20:16	108-10-1	
Styrene	ND	ug/L	1.0	1		11/21/15 20:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 20:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/21/15 20:16	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/21/15 20:16	127-18-4	
Toluene	ND	ug/L	1.0	1		11/21/15 20:16	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/21/15 20:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/21/15 20:16	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/21/15 20:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/21/15 20:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/21/15 20:16	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/21/15 20:16	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/21/15 20:16	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/21/15 20:16	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		11/21/15 20:16	460-00-4	

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ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: TRIP BLANK **Lab ID: 92277140007** Collected: 11/19/15 00:00 Received: 11/20/15 09:06 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		11/21/15 20:16	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		11/21/15 20:16	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: GWD/2690 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 1613797 | Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/24/15 13:12	
Fluoride	mg/L	ND	0.10	11/24/15 13:12	
Sulfate	mg/L	ND	1.0	11/24/15 13:12	

LABORATORY CONTROL SAMPLE: 1613798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.6	101	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	50	48.6	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1613799 1613800

Parameter	Units	92277031001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.6	50	50	54.0	54.9	97	99	90-110	2	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	92	94	90-110	1	20	
Sulfate	mg/L	5.2	50	50	52.3	53.1	94	96	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1613801 1613802

Parameter	Units	92277140004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	287	50	50	331	332	88	90	90-110	0	20	M2,M6
Fluoride	mg/L	0.34	2.5	2.5	2.7	2.7	94	94	90-110	1	20	
Sulfate	mg/L	6.0	50	50	53.1	53.5	94	95	90-110	1	20	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: MERP/8706 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 1616593 Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	12/01/15 12:26	

LABORATORY CONTROL SAMPLE: 1616594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1616595 1616596

Parameter	Units	92277140001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.6	2.6	101	100	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: MPRP/20122 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 1615891 | Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	12/01/15 16:21	
Arsenic	ug/L	ND	10.0	12/01/15 16:21	
Barium	ug/L	ND	5.0	12/01/15 16:21	
Beryllium	ug/L	ND	1.0	12/01/15 16:21	
Cadmium	ug/L	ND	1.0	12/01/15 16:21	
Calcium	ug/L	ND	100	12/01/15 16:21	
Chromium	ug/L	ND	5.0	12/01/15 16:21	
Cobalt	ug/L	ND	5.0	12/01/15 16:21	
Copper	ug/L	ND	5.0	12/01/15 16:21	
Lead	ug/L	ND	5.0	12/01/15 16:21	
Molybdenum	ug/L	ND	5.0	12/01/15 16:21	
Nickel	ug/L	ND	5.0	12/01/15 16:21	
Selenium	ug/L	ND	10.0	12/01/15 16:21	
Silver	ug/L	ND	5.0	12/01/15 16:21	
Thallium	ug/L	ND	5.4	12/01/15 17:42	
Vanadium	ug/L	ND	5.0	12/01/15 16:21	
Zinc	ug/L	ND	10.0	12/01/15 16:21	

LABORATORY CONTROL SAMPLE: 1615892

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	485	97	80-120	
Arsenic	ug/L	500	463	93	80-120	
Barium	ug/L	500	479	96	80-120	
Beryllium	ug/L	500	480	96	80-120	
Cadmium	ug/L	500	477	95	80-120	
Calcium	ug/L	5000	4740	95	80-120	
Chromium	ug/L	500	474	95	80-120	
Cobalt	ug/L	500	479	96	80-120	
Copper	ug/L	500	484	97	80-120	
Lead	ug/L	500	474	95	80-120	
Molybdenum	ug/L	500	506	101	80-120	
Nickel	ug/L	500	478	96	80-120	
Selenium	ug/L	500	468	94	80-120	
Silver	ug/L	250	228	91	80-120	
Thallium	ug/L	500	465	93	80-120	
Vanadium	ug/L	500	475	95	80-120	
Zinc	ug/L	500	474	95	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1615893 1615894

Parameter	Units	92276295009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	493	461	98	92	75-125	7	25	
Arsenic	ug/L	ND	500	500	480	447	96	89	75-125	7	25	
Barium	ug/L	92.7	500	500	578	554	97	92	75-125	4	25	
Beryllium	ug/L	ND	500	500	489	461	98	92	75-125	6	25	
Cadmium	ug/L	ND	500	500	487	453	97	91	75-125	7	25	
Calcium	ug/L	32300	5000	5000	36900	37500	93	105	75-125	2	25	
Chromium	ug/L	ND	500	500	481	457	96	91	75-125	5	25	
Cobalt	ug/L	2.5J	500	500	478	449	95	89	75-125	6	25	
Copper	ug/L	ND	500	500	498	467	99	93	75-125	6	25	
Lead	ug/L	ND	500	500	473	442	94	88	75-125	7	25	
Molybdenum	ug/L	ND	500	500	516	486	103	97	75-125	6	25	
Nickel	ug/L	ND	500	500	476	447	95	89	75-125	6	25	
Selenium	ug/L	ND	500	500	478	445	95	89	75-125	7	25	
Silver	ug/L	ND	250	250	236	220	94	88	75-125	7	25	
Thallium	ug/L	ND	500	500	488	453	97	90	75-125	8	25	
Vanadium	ug/L	3.7J	500	500	491	462	98	92	75-125	6	25	
Zinc	ug/L	ND	500	500	468	442	94	88	75-125	6	25	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: MPRP/60088 Analysis Method: EPA 6020
QC Batch Method: EPA 3020 Analysis Description: 6020 MET
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 2148504 Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	12/04/15 09:30	
Lithium	ug/L	ND	0.50	12/04/15 09:30	

LABORATORY CONTROL SAMPLE: 2148505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	83.4	104	80-120	
Lithium	ug/L	80	86.6	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2148506 2148507

Parameter	Units	92277140003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6.2	80	80	91.3	95.6	106	112	75-125	5	20	
Lithium	ug/L	20.0	80	80	109	114	111	117	75-125	4	20	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: MSV/34380 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006, 92277140007

METHOD BLANK: 1612657 Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006, 92277140007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	11/21/15 12:02	
1,1,1-Trichloroethane	ug/L	ND	1.0	11/21/15 12:02	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	11/21/15 12:02	
1,1,2-Trichloroethane	ug/L	ND	1.0	11/21/15 12:02	
1,1-Dichloroethane	ug/L	ND	1.0	11/21/15 12:02	
1,1-Dichloroethene	ug/L	ND	1.0	11/21/15 12:02	
1,2,3-Trichloropropane	ug/L	ND	1.0	11/21/15 12:02	
1,2-Dichlorobenzene	ug/L	ND	1.0	11/21/15 12:02	
1,2-Dichloroethane	ug/L	ND	1.0	11/21/15 12:02	
1,2-Dichloropropane	ug/L	ND	1.0	11/21/15 12:02	
1,4-Dichlorobenzene	ug/L	ND	1.0	11/21/15 12:02	
2-Butanone (MEK)	ug/L	ND	5.0	11/21/15 12:02	
2-Hexanone	ug/L	ND	5.0	11/21/15 12:02	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	11/21/15 12:02	
Acetone	ug/L	ND	25.0	11/21/15 12:02	
Acrylonitrile	ug/L	ND	10.0	11/21/15 12:02	
Benzene	ug/L	ND	1.0	11/21/15 12:02	
Bromochloromethane	ug/L	ND	1.0	11/21/15 12:02	
Bromodichloromethane	ug/L	ND	1.0	11/21/15 12:02	
Bromoform	ug/L	ND	1.0	11/21/15 12:02	
Bromomethane	ug/L	ND	2.0	11/21/15 12:02	
Carbon disulfide	ug/L	ND	2.0	11/21/15 12:02	
Carbon tetrachloride	ug/L	ND	1.0	11/21/15 12:02	
Chlorobenzene	ug/L	ND	1.0	11/21/15 12:02	
Chloroethane	ug/L	ND	1.0	11/21/15 12:02	
Chloroform	ug/L	ND	1.0	11/21/15 12:02	
Chloromethane	ug/L	ND	1.0	11/21/15 12:02	
cis-1,2-Dichloroethene	ug/L	ND	1.0	11/21/15 12:02	
cis-1,3-Dichloropropene	ug/L	ND	1.0	11/21/15 12:02	
Dibromochloromethane	ug/L	ND	1.0	11/21/15 12:02	
Dibromomethane	ug/L	ND	1.0	11/21/15 12:02	
Ethylbenzene	ug/L	ND	1.0	11/21/15 12:02	
Iodomethane	ug/L	ND	5.0	11/21/15 12:02	
Methylene Chloride	ug/L	ND	1.0	11/21/15 12:02	
Styrene	ug/L	ND	1.0	11/21/15 12:02	
Tetrachloroethene	ug/L	ND	1.0	11/21/15 12:02	
Toluene	ug/L	ND	1.0	11/21/15 12:02	
trans-1,2-Dichloroethene	ug/L	ND	1.0	11/21/15 12:02	
trans-1,3-Dichloropropene	ug/L	ND	1.0	11/21/15 12:02	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	11/21/15 12:02	
Trichloroethene	ug/L	ND	1.0	11/21/15 12:02	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

METHOD BLANK: 1612657 Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006, 92277140007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	11/21/15 12:02	
Vinyl acetate	ug/L	ND	2.0	11/21/15 12:02	
Vinyl chloride	ug/L	ND	1.0	11/21/15 12:02	
Xylene (Total)	ug/L	ND	2.0	11/21/15 12:02	
1,2-Dichloroethane-d4 (S)	%	100	70-130	11/21/15 12:02	
4-Bromofluorobenzene (S)	%	105	70-130	11/21/15 12:02	
Toluene-d8 (S)	%	101	70-130	11/21/15 12:02	

LABORATORY CONTROL SAMPLE: 1612658

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	46.2	92	80-125	
1,1,1-Trichloroethane	ug/L	50	48.8	98	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	44.0	88	79-124	
1,1,2-Trichloroethane	ug/L	50	49.4	99	85-125	
1,1-Dichloroethane	ug/L	50	49.2	98	73-126	
1,1-Dichloroethene	ug/L	50	53.2	106	66-135	
1,2,3-Trichloropropane	ug/L	50	48.1	96	75-130	
1,2-Dichlorobenzene	ug/L	50	47.4	95	80-133	
1,2-Dichloroethane	ug/L	50	48.3	97	67-128	
1,2-Dichloropropane	ug/L	50	46.1	92	75-132	
1,4-Dichlorobenzene	ug/L	50	48.0	96	78-130	
2-Butanone (MEK)	ug/L	100	105	105	61-144	
2-Hexanone	ug/L	100	92.9	93	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	104	104	72-135	
Acetone	ug/L	100	110	110	48-146	
Acrylonitrile	ug/L	250	259	104	40-160	
Benzene	ug/L	50	49.7	99	80-125	
Bromochloromethane	ug/L	50	52.4	105	71-125	
Bromodichloromethane	ug/L	50	45.7	91	78-124	
Bromoform	ug/L	50	40.8	82	71-128	
Bromomethane	ug/L	50	49.5	99	40-160	
Carbon disulfide	ug/L	50	53.4	107	50-160	
Carbon tetrachloride	ug/L	50	51.3	103	69-131	
Chlorobenzene	ug/L	50	45.6	91	81-122	
Chloroethane	ug/L	50	52.6	105	39-148	
Chloroform	ug/L	50	50.7	101	73-127	
Chloromethane	ug/L	50	52.3	105	44-146	
cis-1,2-Dichloroethene	ug/L	50	51.0	102	74-124	
cis-1,3-Dichloropropene	ug/L	50	48.2	96	72-132	
Dibromochloromethane	ug/L	50	44.7	89	78-125	
Dibromomethane	ug/L	50	52.2	104	82-120	
Ethylbenzene	ug/L	50	45.2	90	79-121	
Iodomethane	ug/L	100	99.4	99	39-154	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

LABORATORY CONTROL SAMPLE: 1612658

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	52.4	105	64-133	
Styrene	ug/L	50	45.8	92	84-126	
Tetrachloroethene	ug/L	50	47.1	94	78-122	
Toluene	ug/L	50	47.4	95	80-121	
trans-1,2-Dichloroethene	ug/L	50	54.2	108	71-127	
trans-1,3-Dichloropropene	ug/L	50	46.8	94	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	39.3	79	40-160	
Trichloroethene	ug/L	50	47.9	96	78-122	
Trichlorofluoromethane	ug/L	50	53.0	106	53-137	
Vinyl acetate	ug/L	100	99.3	99	40-160	
Vinyl chloride	ug/L	50	59.0	118	58-137	
Xylene (Total)	ug/L	150	133	88	81-126	
1,2-Dichloroethane-d4 (S)	%			98	70-130	
4-Bromofluorobenzene (S)	%			106	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1612659

Parameter	Units	92277140001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.5	103	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.6	118	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.7	94	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	22.5	113	70-130	
1,1-Dichloroethane	ug/L	ND	20	23.8	119	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.1	131	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	20.0	100	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.8	114	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.9	110	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	45.8	114	70-130	
2-Hexanone	ug/L	ND	40	40.9	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	47.9	120	70-130	
Acetone	ug/L	ND	40	51.6	115	70-130	
Acrylonitrile	ug/L	ND	100	119	119	70-130	
Benzene	ug/L	ND	20	23.5	117	70-148	
Bromochloromethane	ug/L	ND	20	24.9	125	70-130	
Bromodichloromethane	ug/L	ND	20	21.2	106	70-130	
Bromoform	ug/L	ND	20	17.4	87	70-130	
Bromomethane	ug/L	ND	20	20.8	104	70-130	
Carbon disulfide	ug/L	ND	20	25.1	125	70-130	
Carbon tetrachloride	ug/L	ND	20	24.1	121	70-130	
Chlorobenzene	ug/L	ND	20	20.8	104	70-146	
Chloroethane	ug/L	ND	20	25.9	130	70-130	
Chloroform	ug/L	ND	20	25.0	120	70-130	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

MATRIX SPIKE SAMPLE: 1612659

Parameter	Units	92277140001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	25.2	126	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	24.9	125	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	21.8	109	70-130	
Dibromochloromethane	ug/L	ND	20	19.0	95	70-130	
Dibromomethane	ug/L	ND	20	23.8	119	70-130	
Ethylbenzene	ug/L	ND	20	20.4	102	70-130	
Iodomethane	ug/L	ND	40	46.1	115	70-130	
Methylene Chloride	ug/L	ND	20	24.8	124	70-130	
Styrene	ug/L	ND	20	19.6	98	70-130	
Tetrachloroethene	ug/L	ND	20	22.1	111	70-130	
Toluene	ug/L	ND	20	22.7	112	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	25.6	128	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	21.1	105	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	15.0	75	70-130	
Trichloroethene	ug/L	ND	20	23.1	115	69-151	
Trichlorofluoromethane	ug/L	ND	20	26.1	130	70-130	
Vinyl acetate	ug/L	ND	40	39.2	98	70-130	
Vinyl chloride	ug/L	ND	20	28.9	144	70-130	M1
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				104	70-130	
Toluene-d8 (S)	%				101	70-130	

SAMPLE DUPLICATE: 1612660

Parameter	Units	92277140002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

SAMPLE DUPLICATE: 1612660

Parameter	Units	92277140002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	.18J		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	101	103	2		
4-Bromofluorobenzene (S)	%	106	103	2		
Toluene-d8 (S)	%	102	101	1		

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QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: WET/41589 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 1613762 Matrix: Water
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	11/24/15 16:50	

LABORATORY CONTROL SAMPLE: 1613763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	125	131	105	90-110	

SAMPLE DUPLICATE: 1613764

Parameter	Units	92276570001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	217	218	0	5	

SAMPLE DUPLICATE: 1613765

Parameter	Units	92277140006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-2 **Lab ID: 92277140001** Collected: 11/19/15 11:00 Received: 11/20/15 09:06 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.985 ± 0.563 (0.518)** **C:NA T:86%**	pCi/L	11/30/15 13:05	13982-63-3	
Radium-228	EPA 904.0	**1.75 ± 0.521 (0.623)** **C:84% T:84%**	pCi/L	11/30/15 18:49	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-3 **Lab ID: 92277140002** Collected: 11/19/15 13:15 Received: 11/20/15 09:06 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.816 ± 0.574 (0.732)** **C:NA T:92%**	pCi/L	11/30/15 13:06	13982-63-3	
Radium-228	EPA 904.0	**1.95 ± 0.550 (0.617)** **C:83% T:89%**	pCi/L	11/30/15 18:49	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-4 **Lab ID: 92277140003** Collected: 11/19/15 15:10 Received: 11/20/15 09:06 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.406 ± 0.378 (0.498)** **C:NA T:97%**	pCi/L	11/30/15 12:50	13982-63-3	
Radium-228	EPA 904.0	**0.174 ± 0.306 (0.669)** **C:82% T:89%**	pCi/L	11/30/15 18:49	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: MW-4 FIELD DUPLICATE **Lab ID: 92277140004** Collected: 11/19/15 16:00 Received: 11/20/15 09:06 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.620 ± 0.640 (0.972)** **C:NA T:89%**	pCi/L	11/30/15 12:51	13982-63-3	
Radium-228	EPA 904.0	**0.303 ± 0.287 (0.586)** **C:86% T:90%**	pCi/L	11/30/15 19:05	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277140005** Collected: 11/19/15 16:20 Received: 11/20/15 09:06 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.143 ± 0.445 (0.861) C:NA T:94%**	pCi/L	11/30/15 13:18	13982-63-3	
Radium-228	EPA 904.0	**0.298 ± 0.289 (0.592) C:82% T:93%**	pCi/L	11/30/15 19:05	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Sample: EQUIPMENT BLANK **Lab ID: 92277140006** Collected: 11/19/15 16:30 Received: 11/20/15 09:06 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.268 (0.546)** **C:NA T:108%**	pCi/L	11/30/15 13:18	13982-63-3	
Radium-228	EPA 904.0	**0.589 ± 0.330 (0.583)** **C:83% T:82%**	pCi/L	11/30/15 19:05	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: RADC/26980 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 988719 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.310 (0.696) C:NA T:100%	pCi/L	11/30/15 12:01	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

QC Batch: RADC/26983 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92277140001, 92277140002, 92277140003, 92277140004, 92277140005, 92277140006

METHOD BLANK: 988722 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.714 ± 0.326 (0.547) C:87% T:96%	pCi/L	11/30/15 18:48	

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QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M2	Matrix spike recovery was below QC limits due to sample dilution. Data acceptance based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92277140001	**MW-2**	EPA 300.0	GWD/2690		
92277140002	**MW-3**	EPA 300.0	GWD/2690		
92277140003	**MW-4**	EPA 300.0	GWD/2690		
92277140004	**MW-4 FIELD DUPLICATE**	EPA 300.0	GWD/2690		
92277140005	**AMBIENT/FIELD BLANK**	EPA 300.0	GWD/2690		
92277140006	**EQUIPMENT BLANK**	EPA 300.0	GWD/2690		
92277140001	**MW-2**	EPA 3010A	MPRP/20122	EPA 6010	ICP/18151
92277140002	**MW-3**	EPA 3010A	MPRP/20122	EPA 6010	ICP/18151
92277140003	**MW-4**	EPA 3010A	MPRP/20122	EPA 6010	ICP/18151
92277140004	**MW-4 FIELD DUPLICATE**	EPA 3010A	MPRP/20122	EPA 6010	ICP/18151
92277140005	**AMBIENT/FIELD BLANK**	EPA 3010A	MPRP/20122	EPA 6010	ICP/18151
92277140006	**EQUIPMENT BLANK**	EPA 3010A	MPRP/20122	EPA 6010	ICP/18151
92277140001	**MW-2**	EPA 3020	MPRP/60088	EPA 6020	ICPM/27762
92277140002	**MW-3**	EPA 3020	MPRP/60088	EPA 6020	ICPM/27762
92277140003	**MW-4**	EPA 3020	MPRP/60088	EPA 6020	ICPM/27762
92277140004	**MW-4 FIELD DUPLICATE**	EPA 3020	MPRP/60088	EPA 6020	ICPM/27762
92277140005	**AMBIENT/FIELD BLANK**	EPA 3020	MPRP/60088	EPA 6020	ICPM/27762
92277140006	**EQUIPMENT BLANK**	EPA 3020	MPRP/60088	EPA 6020	ICPM/27762
92277140001	**MW-2**	EPA 7470	MERP/8706	EPA 7470	MERC/8361
92277140002	**MW-3**	EPA 7470	MERP/8706	EPA 7470	MERC/8361
92277140003	**MW-4**	EPA 7470	MERP/8706	EPA 7470	MERC/8361
92277140004	**MW-4 FIELD DUPLICATE**	EPA 7470	MERP/8706	EPA 7470	MERC/8361
92277140005	**AMBIENT/FIELD BLANK**	EPA 7470	MERP/8706	EPA 7470	MERC/8361
92277140006	**EQUIPMENT BLANK**	EPA 7470	MERP/8706	EPA 7470	MERC/8361
92277140001	**MW-2**	EPA 8260	MSV/34380		
92277140002	**MW-3**	EPA 8260	MSV/34380		
92277140003	**MW-4**	EPA 8260	MSV/34380		
92277140004	**MW-4 FIELD DUPLICATE**	EPA 8260	MSV/34380		
92277140005	**AMBIENT/FIELD BLANK**	EPA 8260	MSV/34380		
92277140006	**EQUIPMENT BLANK**	EPA 8260	MSV/34380		
92277140007	**TRIP BLANK**	EPA 8260	MSV/34380		
92277140001	**MW-2**	EPA 903.1	RADC/26980		
92277140002	**MW-3**	EPA 903.1	RADC/26980		
92277140003	**MW-4**	EPA 903.1	RADC/26980		
92277140004	**MW-4 FIELD DUPLICATE**	EPA 903.1	RADC/26980		
92277140005	**AMBIENT/FIELD BLANK**	EPA 903.1	RADC/26980		
92277140006	**EQUIPMENT BLANK**	EPA 903.1	RADC/26980		
92277140001	**MW-2**	EPA 904.0	RADC/26983		
92277140002	**MW-3**	EPA 904.0	RADC/26983		
92277140003	**MW-4**	EPA 904.0	RADC/26983		
92277140004	**MW-4 FIELD DUPLICATE**	EPA 904.0	RADC/26983		
92277140005	**AMBIENT/FIELD BLANK**	EPA 904.0	RADC/26983		
92277140006	**EQUIPMENT BLANK**	EPA 904.0	RADC/26983		
92277140001	**MW-2**	SM 2540C	WET/41589		
92277140002	**MW-3**	SM 2540C	WET/41589		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92277140

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92277140003	**MW-4**	SM 2540C	WET/41589		
92277140004	**MW-4 FIELD DUPLICATE**	SM 2540C	WET/41589		
92277140005	**AMBIENT/FIELD BLANK**	SM 2540C	WET/41589		
92277140006	**EQUIPMENT BLANK**	SM 2540C	WET/41589		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: November 17, 2015 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16.1**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USP ☐ Client ☐ Commercial ☑ Pace Other_____

Optional
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1505 **Type of Ice:** (Wet) Blue None ☐ Samples on ice, cooling process has begun

Temp Correction Factor No Correction

Corrected Cooler Temp.: 3.8 °C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: TM 11/20

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 11/20/15

SRF Review: [signature] Date: 11/21/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92277140

92277140

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995472

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HDR	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Charah - Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- ☐ NPDES
- ☑ GROUND WATER
- ☐ DRINKING WATER
- ☐ UST
- ☐ RCRA
- ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Radium 226/228	Metals	VOC (8260)	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92277140
1	MW-2		G			11/19/15	1100		11										3	2	3	1	1	1		001
2	MW-3		G			11/19/15	1315		11										3	2	3	1	1	1		002
3	MW-4		G			11/19/15	1510		11										3	2	3	1	1	1		003
4	MW-4 Field Duplicate		G			11/19/15	1600		11										3	2	3	1	1	1		004
5																										—
6	Ambient / Field Blank		G			11/19/15	1620		11										3	2	3	1	1	1		005
7	Equipment Blank		G			11/19/15	1630		11										3	2	3	1	1	1		006
8	Trip Blank		G			11/19/15			2												2					007
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	11/19/15	1733	Scott Leeper PACE	11-20-15	0906				
	Scott Leeper PACE	11-20-15	1425	Dmoore / Pace	11-20-19	1425	38	4	N	4

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 11/19/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: ~~Cherrah-Brickshaven~~ HDR Location: Moncure, NC Project Name/#: Cherrah-Brickshaven

Name and Afiliation (Sampler(s): C.S, J.A/PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-2 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 48.13 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 37.07 ft Casing Volume: 1.80278 gallons

Height of Water Column: 11.06 ft Cal. 3 Volumes: 5.40834 gallons

Purge Information

Date Purged: 11 / 19 / 15 Start Time: 0935 Finish: 1100 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 8000 mL ~~gallons~~

Sampling Information

Date Collected: 11/19/15 Time Collected: 1100 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		Metals x2, VOC (8260) x3
		TDS Fluoride
		Sulfate/Chloride

Field Measurements/Observations

Sample Temp (°C): 21.5 Time: 1100 Turbidity (ntu): 9.60 Time: 1100

Sample pH (s.u.): ~~4~~ 7.60 Time: Diss Oxy (mg/L): 3.24 Time: 1100

Specific Cond. (uS): 4059 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 107.0 Time: Other: Iron: 0.0 mg/L Time: 1100

Odor: None Time: Appearance: Cloudy → clear

General/Weather Observations

Rainy, muddy. No grading operation today. No recharge

Sampler Signature/Date: [signature] /11/19/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
0940	~~6.86~~ 6.86	4033	-10.6	44.64	4.15	19.7	500mL	Water level: (ft) 37.70
0950	7.18	4026	6.2	41.90	4.26	20.2	1000mL	38.00
0955	7.37	4036	21.6	47.74	3.90	20.3	1500mL	38.11
1005	7.45	4039	60.5	49.00	3.92	20.3	2500mL	38.81
1015	7.51	4041	89.5	38.16	3.88	20.3	3500mL	39.00

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: Charter / Brookhaven

Location: Mercure, NC

Project: Charter – Brookhaven

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level: (ft)
1025	7.55	4046	98.6	28.20	3.84	20.6	4500 mL	39.31
1035	7.57	4046	102.7	19.30	3.83	21.1	5500 mL	39.60
1045	7.59	4054	104.3	13.05	3.26	21.2	6500 mL	39.85
1055	7.60	4057	106.6	9.62	3.25	21.5	7000 mL	39.97
1100	7.60	4059	107.0	9.60	3.24	21.5	8000 mL	40.00

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: ~~Chorrah Brickhaven~~ HDR 11/19/15 Location: Moncure, NC Project Name/#: Chorrah Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A / PAE

Name and Afiliation (Inspector):

Well Information

Well ID: MW-3

Well Locked: YES - Broken lock NO

Well Diameter: 2"

Construction: PVC Steel Stainless Steel

Total Well Depth: 43.60 ft

Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 12.27 ft

Casing Volume: 5.10679 gallons

Height of Water Column: 31.33 ft

Cal. 3 Volumes: 15.32037 gallons

Purge Information

Date Purged: 11 / 19 / 15 Start Time: 1240 Finish: 1315 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 3500 mL ~~gallons~~

Sampling Information

Date Collected: 11/19/15 Time Collected: 1315 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3, metals x2, UOC (8260)x3, Fluoride, chloride/sulfate, TDS

Field Measurements/Observations

Sample Temp (°C): 21.7 Time: 1315

Sample pH (s.u.): 7.50 Time:

Specific Cond. (uS): 4313 Time:

ReDox (mV): 137.5 Time:

Odor: None Time:

Turbidity (ntu): 1.61 Time: 1315

Diss Oxy (mg/L): 2.92 Time: 1315

Res. Cl (mg/L): — Time: —

Other: Iron: 0.0 Time: 1315

Appearance: Clear

General/Weather Observations

Cloudy, 70°F muddy, No recharge

Sampler Signature/Date: [signature] / 11/19/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1245	7.49	4314	148.8	3.37	3.30	21.2	500mL	13.00
1250	7.47	4313	146.8	2.09	3.15	21.5	1000mL	13.40
1255	7.46	4313	144.8	2.01	3.07	21.7	1500mL	13.60
1300	7.48	4320	141.4	2.92	2.97	21.7	2000mL	14.00
1305	7.48	4316	139.6	2.03	2.91	21.7	2500mL	14.30

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Monroe, NC

Project: Cherokee - Brickhaven

Well ID: MW-3

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1310	7.50	4308	138.4	1.90	2.91	21.7	3000 mL	14.70
1315	7.50	4313	137.5	1.61	2.92	21.7	3500 mL	15.00

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: ~~Charah Brickhaven~~ HDR Location: Mancue, NC Project Name/#: Charah/Brickhaven

Name and Afiliation (Sampler(s)): C.S, J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-4 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 25.74 ft Multi Factor*: 0.1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.30 ft Casing Volume: 2.51672 gallons

Height of Water Column: 15.44 ft Cal. 3 Volumes: 7.55016 gallons

Purge Information

Date Purged: 11 / 19 / 15 Start Time: 1420 Finish: 1510 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 3000 ml ~~gallons~~

Sampling Information

Date Collected: 11/19/15 Time Collected: 1510 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium/226/228x3,
		metals x2, VOC (8260)x3,
		TDS, Fluoride,
		Sulfate/Chloride

Field Measurements/Observations

Sample Temp (°C): 20.4 Time: 1510 Turbidity (ntu): 8.21 Time: 1510

Sample pH (s.u.): 6.30 Time: Diss Oxy (mg/L): 0.40 Time: 1510

Specific Cond. (uS): 1519 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): -57.8 Time: Other: ISON: 3.00 mg/L Time: 1510

Odor: None Time: Appearance: Clear

General/Weather Observations

Cloudy 70°F. muddy conditions. OK/good recovery

Sampler Signature/Date: [signature] 11/19/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level (ft)
1425	6.44	1673	-64.0	15.08	1.20	21.2	500ml	10.35
1430	6.36	1609	-64.1	22.55	0.78	21.2	1000ml	10.50
1435	6.33	1556	-60.1	21.72	0.55	21.0	1500ml	10.50
1445	6.30	1539	-60.4	22.99	0.44	21.0	2500ml	10.50
1455	6.30	1524	-58.3	9.16	0.40	20.8	3500ml	10.50

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Charrah - Brickhaven

Well ID: MW-4

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water level: (ft)
1505	6.30	1522	-58.9	8.13	0.40	20.9	4500mL	10.50
1510	6.30	1519	-57.8	8.21	0.40	20.9	5000mL	10.50

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

December 08, 2015

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on November 23, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92277227001	**MW-6**	Water	11/20/15 09:50	11/23/15 08:25
92277227002	**MW-8**	Water	11/20/15 12:55	11/23/15 08:25
92277227003	**MW-7**	Water	11/20/15 14:20	11/23/15 08:25
92277227004	**MW-1**	Water	11/20/15 17:45	11/23/15 08:25
92277227005	**AMBIENT/FIELD BLANK**	Water	11/20/15 17:40	11/23/15 08:25
92277227006	**EQUIPMENT BLANK**	Water	11/20/15 18:00	11/23/15 08:25
92277227007	**TRIP BLANK**	Water	11/20/15 00:00	11/23/15 08:25

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92277227001	**MW-6**	EPA 300.0	EIC	3	PASI-G
		EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277227002	**MW-8**	EPA 300.0	EIC	3	PASI-G
		EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277227003	**MW-7**	EPA 300.0	EIC	3	PASI-G
		EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92277227004	**MW-1**	EPA 300.0	EIC	3	PASI-G
		EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92277227005	**AMBIENT/FIELD BLANK**	EPA 300.0	EIC	3	PASI-G
		EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92277227006	**EQUIPMENT BLANK**	EPA 300.0	EIC	3	PASI-G
		EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92277227007	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277227001	**MW-6**					
EPA 300.0	Chloride	242	mg/L	5.0	11/30/15 14:51	
EPA 300.0	Fluoride	0.39	mg/L	0.10	11/30/15 11:02	
EPA 300.0	Sulfate	137	mg/L	5.0	11/30/15 14:51	
EPA 6010	Barium	142	ug/L	5.0	11/30/15 18:41	
EPA 6010	Calcium	37600	ug/L	100	11/30/15 18:41	
EPA 903.1	Radium-226	0.0638 ± 0.451 (0.900) C:NA T:96%	pCi/L		12/07/15 11:16	
EPA 904.0	Radium-228	0.791 ± 0.384 (0.666) C:86% T:83%	pCi/L		12/07/15 18:21	
SM 2540C	Total Dissolved Solids	429	mg/L	25.0	11/24/15 18:42	
92277227002	**MW-8**					
EPA 300.0	Chloride	939	mg/L	20.0	11/30/15 18:12	
EPA 300.0	Sulfate	4.4	mg/L	1.0	11/30/15 12:19	
EPA 6010	Antimony	10.1	ug/L	5.0	11/30/15 18:44	
EPA 6010	Barium	1550	ug/L	5.0	11/30/15 18:44	
EPA 6010	Calcium	194000	ug/L	1000	12/01/15 18:38	
EPA 6010	Zinc	22.1	ug/L	10.0	11/30/15 18:44	
EPA 903.1	Radium-226	1.16 ± 0.729 (0.958) C:NA T:93%	pCi/L		12/07/15 10:58	
EPA 904.0	Radium-228	0.702 ± 0.338 (0.578) C:86% T:91%	pCi/L		12/07/15 18:21	
SM 2540C	Total Dissolved Solids	224	mg/L	25.0	11/24/15 18:42	
92277227003	**MW-7**					
EPA 300.0	Chloride	552	mg/L	20.0	11/30/15 17:42	
EPA 300.0	Fluoride	0.37	mg/L	0.10	11/30/15 12:44	
EPA 300.0	Sulfate	44.3	mg/L	1.0	11/30/15 12:44	
EPA 6010	Barium	364	ug/L	5.0	11/30/15 18:47	
EPA 6010	Calcium	44200	ug/L	100	11/30/15 18:47	
EPA 6010	Nickel	7.2	ug/L	5.0	11/30/15 18:47	
EPA 903.1	Radium-226	0.856 ± 0.633 (0.857) C:NA T:90%	pCi/L		12/07/15 11:38	
EPA 904.0	Radium-228	1.15 ± 0.437 (0.652) C:83% T:80%	pCi/L		12/07/15 18:22	
SM 2540C	Total Dissolved Solids	129	mg/L	25.0	11/24/15 18:42	

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92277227004	**MW-1**					
EPA 300.0	Chloride	172	mg/L	3.0	11/30/15 18:43	
EPA 300.0	Fluoride	0.16	mg/L	0.10	11/30/15 13:09	
EPA 300.0	Sulfate	9.8	mg/L	1.0	11/30/15 13:09	
EPA 6010	Barium	153	ug/L	5.0	11/30/15 18:50	
EPA 6010	Calcium	58700	ug/L	100	11/30/15 18:50	
EPA 903.1	Radium-226	0.414 ± 0.430 (0.640) C:NA T:90%	pCi/L		12/07/15 11:49	
EPA 904.0	Radium-228	0.511 ± 0.304 (0.561) C:85% T:92%	pCi/L		12/07/15 18:22	
SM 2540C	Total Dissolved Solids	569	mg/L	25.0	11/25/15 14:01	
92277227005	**AMBIENT/FIELD BLANK**					
EPA 903.1	Radium-226	0.472 ± 0.579 (0.951) C:NA T:97%	pCi/L		12/07/15 11:17	
EPA 904.0	Radium-228	0.439 ± 0.319 (0.621) C:85% T:88%	pCi/L		12/07/15 18:22	
92277227006	**EQUIPMENT BLANK**					
EPA 903.1	Radium-226	0.342 ± 0.521 (0.897) C:NA T:94%	pCi/L		12/07/15 11:29	
EPA 904.0	Radium-228	0.961 ± 0.410 (0.661) C:87% T:78%	pCi/L		12/07/15 18:22	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-6 **Lab ID: 92277227001** Collected: 11/20/15 09:50 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**242**	mg/L	5.0	5		11/30/15 14:51	16887-00-6	
Fluoride	**0.39**	mg/L	0.10	1		11/30/15 11:02	16984-48-8	
Sulfate	**137**	mg/L	5.0	5		11/30/15 14:51	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:41	7440-38-2	
Barium	**142**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:41	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:41	7440-43-9	
Calcium	**37600**	ug/L	100	1	11/25/15 22:00	11/30/15 18:41	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:41	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:32	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:41	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:41	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	12/02/15 10:00	12/02/15 15:30	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 00:09	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 00:09	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 00:09	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 00:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 00:09	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 00:09	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 00:09	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 00:09	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 00:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 00:09	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 00:09	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 00:09	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 00:09	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 00:09	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 00:09	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 00:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 00:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 00:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 00:09	110-57-6	M1

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-6 **Lab ID: 92277227001** Collected: 11/20/15 09:50 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 00:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 00:09	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 00:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 00:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 00:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 00:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 00:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 00:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 00:09	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 00:09	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 00:09	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 00:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 00:09	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 00:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 00:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 00:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 00:09	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 00:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 00:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 00:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 00:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 00:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 00:09	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 00:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 00:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 00:09	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		11/26/15 00:09	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		11/26/15 00:09	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/26/15 00:09	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**429**	mg/L	25.0	1		11/24/15 18:42		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-8 **Lab ID: 92277227002** Collected: 11/20/15 12:55 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**939**	mg/L	20.0	20		11/30/15 18:12	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/30/15 12:19	16984-48-8	
Sulfate	**4.4**	mg/L	1.0	1		11/30/15 12:19	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	**10.1**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:44	7440-38-2	
Barium	**1550**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:44	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:44	7440-43-9	
Calcium	**194000**	ug/L	1000	10	11/25/15 22:00	12/01/15 18:38	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:44	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:35	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:44	7440-62-2	
Zinc	**22.1**	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:44	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	12/02/15 10:00	12/02/15 15:32	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 00:26	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 00:26	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 00:26	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 00:26	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 00:26	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 00:26	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 00:26	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 00:26	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 00:26	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 00:26	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 00:26	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 00:26	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 00:26	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 00:26	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 00:26	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 00:26	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 00:26	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 00:26	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 00:26	110-57-6	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-8 **Lab ID: 92277227002** Collected: 11/20/15 12:55 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 00:26	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 00:26	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 00:26	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 00:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 00:26	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 00:26	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 00:26	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 00:26	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 00:26	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 00:26	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 00:26	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 00:26	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 00:26	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 00:26	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 00:26	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 00:26	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 00:26	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 00:26	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 00:26	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 00:26	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 00:26	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 00:26	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 00:26	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 00:26	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 00:26	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 00:26	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		11/26/15 00:26	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		11/26/15 00:26	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		11/26/15 00:26	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**224**	mg/L	25.0	1		11/24/15 18:42		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-7 **Lab ID: 92277227003** Collected: 11/20/15 14:20 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**552**	mg/L	20.0	20		11/30/15 17:42	16887-00-6	
Fluoride	**0.37**	mg/L	0.10	1		11/30/15 12:44	16984-48-8	
Sulfate	**44.3**	mg/L	1.0	1		11/30/15 12:44	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:47	7440-38-2	
Barium	**364**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:47	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:47	7440-43-9	
Calcium	**44200**	ug/L	100	1	11/25/15 22:00	11/30/15 18:47	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7439-98-7	
Nickel	**7.2**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:47	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:41	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:47	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:47	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	12/02/15 10:00	12/02/15 15:34	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 01:01	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 01:01	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 01:01	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 01:01	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 01:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 01:01	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 01:01	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 01:01	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 01:01	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 01:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 01:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 01:01	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 01:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 01:01	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 01:01	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 01:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:01	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:01	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 01:01	110-57-6	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-7 **Lab ID: 92277227003** Collected: 11/20/15 14:20 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:01	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 01:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:01	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 01:01	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 01:01	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 01:01	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 01:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 01:01	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 01:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 01:01	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 01:01	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 01:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 01:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 01:01	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 01:01	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 01:01	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 01:01	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/26/15 01:01	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		11/26/15 01:01	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/26/15 01:01	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**129**	mg/L	25.0	1		11/24/15 18:42		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-1 **Lab ID: 92277227004** Collected: 11/20/15 17:45 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**172**	mg/L	3.0	3		11/30/15 18:43	16887-00-6	
Fluoride	**0.16**	mg/L	0.10	1		11/30/15 13:09	16984-48-8	
Sulfate	**9.8**	mg/L	1.0	1		11/30/15 13:09	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:50	7440-38-2	
Barium	**153**	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:50	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 18:50	7440-43-9	
Calcium	**58700**	ug/L	100	1	11/25/15 22:00	11/30/15 18:50	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:50	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:44	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 18:50	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 18:50	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	12/02/15 10:00	12/02/15 15:37	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 01:18	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 01:18	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 01:18	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 01:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 01:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 01:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 01:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 01:18	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 01:18	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 01:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 01:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 01:18	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 01:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 01:18	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 01:18	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 01:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:18	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 01:18	110-57-6	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-1 **Lab ID: 92277227004** Collected: 11/20/15 17:45 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 01:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:18	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 01:18	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 01:18	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 01:18	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 01:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 01:18	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 01:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:18	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 01:18	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 01:18	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:18	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 01:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 01:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 01:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 01:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 01:18	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 01:18	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		11/26/15 01:18	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		11/26/15 01:18	17060-07-0	
Toluene-d8 (S)	97	%	70-130	1		11/26/15 01:18	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**569**	mg/L	25.0	1		11/25/15 14:01		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277227005** Collected: 11/20/15 17:40 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		11/30/15 13:35	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/30/15 13:35	16984-48-8	
Sulfate	ND	mg/L	1.0	1		11/30/15 13:35	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 19:03	7440-38-2	
Barium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 19:03	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 19:03	7440-43-9	
Calcium	ND	ug/L	100	1	11/25/15 22:00	11/30/15 19:03	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 19:03	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 18:57	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:03	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 19:03	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	12/02/15 10:00	12/02/15 15:51	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 01:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 01:35	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 01:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 01:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 01:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 01:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 01:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 01:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 01:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 01:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 01:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 01:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 01:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 01:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 01:35	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 01:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 01:35	110-57-6	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277227005** Collected: 11/20/15 17:40 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 01:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 01:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 01:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 01:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 01:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 01:35	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 01:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 01:35	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 01:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 01:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 01:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 01:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 01:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 01:35	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 01:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/26/15 01:35	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		11/26/15 01:35	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/26/15 01:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		11/25/15 14:02		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: EQUIPMENT BLANK **Lab ID: 92277227006** Collected: 11/20/15 18:00 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		11/30/15 14:00	16887-00-6	
Fluoride	ND	mg/L	0.10	1		11/30/15 14:00	16984-48-8	
Sulfate	ND	mg/L	1.0	1		11/30/15 14:00	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Antimony	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-36-0	
Arsenic	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 19:06	7440-38-2	
Barium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-39-3	
Beryllium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 19:06	7440-41-7	
Cadmium	ND	ug/L	1.0	1	11/25/15 22:00	11/30/15 19:06	7440-43-9	
Calcium	ND	ug/L	100	1	11/25/15 22:00	11/30/15 19:06	7440-70-2	
Chromium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-47-3	
Cobalt	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-48-4	
Copper	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-50-8	
Lead	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7439-98-7	
Nickel	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-02-0	
Selenium	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 19:06	7782-49-2	
Silver	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-22-4	
Thallium	ND	ug/L	5.4	1	11/25/15 22:00	12/01/15 19:00	7440-28-0	
Vanadium	ND	ug/L	5.0	1	11/25/15 22:00	11/30/15 19:06	7440-62-2	
Zinc	ND	ug/L	10.0	1	11/25/15 22:00	11/30/15 19:06	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	12/02/15 10:00	12/02/15 15:58	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 01:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 01:52	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 01:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 01:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 01:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 01:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 01:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 01:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 01:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 01:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 01:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 01:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 01:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 01:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 01:52	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 01:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 01:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 01:52	110-57-6	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: EQUIPMENT BLANK **Lab ID: 92277227006** Collected: 11/20/15 18:00 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 01:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 01:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 01:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 01:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 01:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 01:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 01:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 01:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 01:52	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 01:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 01:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 01:52	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 01:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 01:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 01:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 01:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 01:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 01:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 01:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 01:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/26/15 01:52	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		11/26/15 01:52	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		11/26/15 01:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		11/25/15 14:02		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: TRIP BLANK **Lab ID: 92277227007** Collected: 11/20/15 00:00 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		11/26/15 02:09	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		11/26/15 02:09	107-13-1	
Benzene	ND	ug/L	1.0	1		11/26/15 02:09	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		11/26/15 02:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		11/26/15 02:09	75-27-4	
Bromoform	ND	ug/L	1.0	1		11/26/15 02:09	75-25-2	
Bromomethane	ND	ug/L	2.0	1		11/26/15 02:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		11/26/15 02:09	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		11/26/15 02:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		11/26/15 02:09	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		11/26/15 02:09	108-90-7	
Chloroethane	ND	ug/L	1.0	1		11/26/15 02:09	75-00-3	
Chloroform	ND	ug/L	1.0	1		11/26/15 02:09	67-66-3	
Chloromethane	ND	ug/L	1.0	1		11/26/15 02:09	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		11/26/15 02:09	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		11/26/15 02:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 02:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		11/26/15 02:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		11/26/15 02:09	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		11/26/15 02:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		11/26/15 02:09	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		11/26/15 02:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 02:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		11/26/15 02:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		11/26/15 02:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 02:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		11/26/15 02:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		11/26/15 02:09	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		11/26/15 02:09	591-78-6	
Iodomethane	ND	ug/L	5.0	1		11/26/15 02:09	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		11/26/15 02:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		11/26/15 02:09	108-10-1	
Styrene	ND	ug/L	1.0	1		11/26/15 02:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 02:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		11/26/15 02:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		11/26/15 02:09	127-18-4	
Toluene	ND	ug/L	1.0	1		11/26/15 02:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		11/26/15 02:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		11/26/15 02:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		11/26/15 02:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		11/26/15 02:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		11/26/15 02:09	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		11/26/15 02:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		11/26/15 02:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		11/26/15 02:09	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		11/26/15 02:09	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: TRIP BLANK **Lab ID: 92277227007** Collected: 11/20/15 00:00 Received: 11/23/15 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		11/26/15 02:09	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		11/26/15 02:09	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: GWD/2700 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006

METHOD BLANK: 1616201 | Matrix: Water
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/30/15 10:12	
Fluoride	mg/L	ND	0.10	11/30/15 10:12	
Sulfate	mg/L	ND	1.0	11/30/15 10:12	

LABORATORY CONTROL SAMPLE: 1616202

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.3	99	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	50	45.9	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1616203 1616204

Parameter	Units	92277227001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	242	50	50	290	292	97	100	90-110	1	20	
Fluoride	mg/L	0.39	2.5	2.5	2.7	2.7	94	94	90-110	1	20	
Sulfate	mg/L	137	50	50	184	185	94	96	90-110	1	20	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: MERP/8711 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004

METHOD BLANK: 1617079 Matrix: Water
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	12/02/15 14:33	

LABORATORY CONTROL SAMPLE: 1617080

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.7	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617081 1617082

Parameter	Units	92276534004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.1	2.1	82	82	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: MERP/8712 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92277227005, 92277227006

METHOD BLANK: 1617083 | Matrix: Water
Associated Lab Samples: 92277227005, 92277227006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	12/02/15 15:46	

LABORATORY CONTROL SAMPLE: 1617084

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617085 1617086

Parameter	Units	92277227005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.6	2.7	104	106	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: MPRP/20122 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006

METHOD BLANK: 1615891 | Matrix: Water
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	12/01/15 16:21	
Arsenic	ug/L	ND	10.0	12/01/15 16:21	
Barium	ug/L	ND	5.0	12/01/15 16:21	
Beryllium	ug/L	ND	1.0	12/01/15 16:21	
Cadmium	ug/L	ND	1.0	12/01/15 16:21	
Calcium	ug/L	ND	100	12/01/15 16:21	
Chromium	ug/L	ND	5.0	12/01/15 16:21	
Cobalt	ug/L	ND	5.0	12/01/15 16:21	
Copper	ug/L	ND	5.0	12/01/15 16:21	
Lead	ug/L	ND	5.0	12/01/15 16:21	
Molybdenum	ug/L	ND	5.0	12/01/15 16:21	
Nickel	ug/L	ND	5.0	12/01/15 16:21	
Selenium	ug/L	ND	10.0	12/01/15 16:21	
Silver	ug/L	ND	5.0	12/01/15 16:21	
Thallium	ug/L	ND	5.4	12/01/15 17:42	
Vanadium	ug/L	ND	5.0	12/01/15 16:21	
Zinc	ug/L	ND	10.0	12/01/15 16:21	

LABORATORY CONTROL SAMPLE: 1615892

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	485	97	80-120	
Arsenic	ug/L	500	463	93	80-120	
Barium	ug/L	500	479	96	80-120	
Beryllium	ug/L	500	480	96	80-120	
Cadmium	ug/L	500	477	95	80-120	
Calcium	ug/L	5000	4740	95	80-120	
Chromium	ug/L	500	474	95	80-120	
Cobalt	ug/L	500	479	96	80-120	
Copper	ug/L	500	484	97	80-120	
Lead	ug/L	500	474	95	80-120	
Molybdenum	ug/L	500	506	101	80-120	
Nickel	ug/L	500	478	96	80-120	
Selenium	ug/L	500	468	94	80-120	
Silver	ug/L	250	228	91	80-120	
Thallium	ug/L	500	465	93	80-120	
Vanadium	ug/L	500	475	95	80-120	
Zinc	ug/L	500	474	95	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1615893 1615894

Parameter	Units	92276295009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	493	461	98	92	75-125	7	25	
Arsenic	ug/L	ND	500	500	480	447	96	89	75-125	7	25	
Barium	ug/L	92.7	500	500	578	554	97	92	75-125	4	25	
Beryllium	ug/L	ND	500	500	489	461	98	92	75-125	6	25	
Cadmium	ug/L	ND	500	500	487	453	97	91	75-125	7	25	
Calcium	ug/L	32300	5000	5000	36900	37500	93	105	75-125	2	25	
Chromium	ug/L	ND	500	500	481	457	96	91	75-125	5	25	
Cobalt	ug/L	2.5J	500	500	478	449	95	89	75-125	6	25	
Copper	ug/L	ND	500	500	498	467	99	93	75-125	6	25	
Lead	ug/L	ND	500	500	473	442	94	88	75-125	7	25	
Molybdenum	ug/L	ND	500	500	516	486	103	97	75-125	6	25	
Nickel	ug/L	ND	500	500	476	447	95	89	75-125	6	25	
Selenium	ug/L	ND	500	500	478	445	95	89	75-125	7	25	
Silver	ug/L	ND	250	250	236	220	94	88	75-125	7	25	
Thallium	ug/L	ND	500	500	488	453	97	90	75-125	8	25	
Vanadium	ug/L	3.7J	500	500	491	462	98	92	75-125	6	25	
Zinc	ug/L	ND	500	500	468	442	94	88	75-125	6	25	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: MSV/34440 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006, 92277227007

METHOD BLANK: 1615384 Matrix: Water
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006, 92277227007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	11/25/15 23:35	
1,1,1-Trichloroethane	ug/L	ND	1.0	11/25/15 23:35	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	11/25/15 23:35	
1,1,2-Trichloroethane	ug/L	ND	1.0	11/25/15 23:35	
1,1-Dichloroethane	ug/L	ND	1.0	11/25/15 23:35	
1,1-Dichloroethene	ug/L	ND	1.0	11/25/15 23:35	
1,2,3-Trichloropropane	ug/L	ND	1.0	11/25/15 23:35	
1,2-Dichlorobenzene	ug/L	ND	1.0	11/25/15 23:35	
1,2-Dichloroethane	ug/L	ND	1.0	11/25/15 23:35	
1,2-Dichloropropane	ug/L	ND	1.0	11/25/15 23:35	
1,4-Dichlorobenzene	ug/L	ND	1.0	11/25/15 23:35	
2-Butanone (MEK)	ug/L	ND	5.0	11/25/15 23:35	
2-Hexanone	ug/L	ND	5.0	11/25/15 23:35	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	11/25/15 23:35	
Acetone	ug/L	ND	25.0	11/25/15 23:35	
Acrylonitrile	ug/L	ND	10.0	11/25/15 23:35	
Benzene	ug/L	ND	1.0	11/25/15 23:35	
Bromochloromethane	ug/L	ND	1.0	11/25/15 23:35	
Bromodichloromethane	ug/L	ND	1.0	11/25/15 23:35	
Bromoform	ug/L	ND	1.0	11/25/15 23:35	
Bromomethane	ug/L	ND	2.0	11/25/15 23:35	
Carbon disulfide	ug/L	ND	2.0	11/25/15 23:35	
Carbon tetrachloride	ug/L	ND	1.0	11/25/15 23:35	
Chlorobenzene	ug/L	ND	1.0	11/25/15 23:35	
Chloroethane	ug/L	ND	1.0	11/25/15 23:35	
Chloroform	ug/L	ND	1.0	11/25/15 23:35	
Chloromethane	ug/L	ND	1.0	11/25/15 23:35	
cis-1,2-Dichloroethene	ug/L	ND	1.0	11/25/15 23:35	
cis-1,3-Dichloropropene	ug/L	ND	1.0	11/25/15 23:35	
Dibromochloromethane	ug/L	ND	1.0	11/25/15 23:35	
Dibromomethane	ug/L	ND	1.0	11/25/15 23:35	
Ethylbenzene	ug/L	ND	1.0	11/25/15 23:35	
Iodomethane	ug/L	ND	5.0	11/25/15 23:35	
Methylene Chloride	ug/L	ND	1.0	11/25/15 23:35	
Styrene	ug/L	ND	1.0	11/25/15 23:35	
Tetrachloroethene	ug/L	ND	1.0	11/25/15 23:35	
Toluene	ug/L	ND	1.0	11/25/15 23:35	
trans-1,2-Dichloroethene	ug/L	ND	1.0	11/25/15 23:35	
trans-1,3-Dichloropropene	ug/L	ND	1.0	11/25/15 23:35	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	11/25/15 23:35	
Trichloroethene	ug/L	ND	1.0	11/25/15 23:35	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

METHOD BLANK: 1615384 Matrix: Water
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006, 92277227007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	11/25/15 23:35	
Vinyl acetate	ug/L	ND	2.0	11/25/15 23:35	
Vinyl chloride	ug/L	ND	1.0	11/25/15 23:35	
Xylene (Total)	ug/L	ND	2.0	11/25/15 23:35	
1,2-Dichloroethane-d4 (S)	%	95	70-130	11/25/15 23:35	
4-Bromofluorobenzene (S)	%	102	70-130	11/25/15 23:35	
Toluene-d8 (S)	%	99	70-130	11/25/15 23:35	

LABORATORY CONTROL SAMPLE: 1615385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	44.3	89	80-125	
1,1,1-Trichloroethane	ug/L	50	42.4	85	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	42.7	85	79-124	
1,1,2-Trichloroethane	ug/L	50	44.6	89	85-125	
1,1-Dichloroethane	ug/L	50	42.3	85	73-126	
1,1-Dichloroethene	ug/L	50	44.7	89	66-135	
1,2,3-Trichloropropane	ug/L	50	47.0	94	75-130	
1,2-Dichlorobenzene	ug/L	50	46.5	93	80-133	
1,2-Dichloroethane	ug/L	50	41.5	83	67-128	
1,2-Dichloropropane	ug/L	50	41.6	83	75-132	
1,4-Dichlorobenzene	ug/L	50	46.8	94	78-130	
2-Butanone (MEK)	ug/L	100	86.9	87	61-144	
2-Hexanone	ug/L	100	85.7	86	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	91.1	91	72-135	
Acetone	ug/L	100	84.8	85	48-146	
Acrylonitrile	ug/L	250	222	89	40-160	
Benzene	ug/L	50	45.2	90	80-125	
Bromochloromethane	ug/L	50	45.5	91	71-125	
Bromodichloromethane	ug/L	50	40.3	81	78-124	
Bromoform	ug/L	50	39.3	79	71-128	
Bromomethane	ug/L	50	41.3	83	40-160	
Carbon disulfide	ug/L	50	45.3	91	50-160	
Carbon tetrachloride	ug/L	50	44.1	88	69-131	
Chlorobenzene	ug/L	50	44.6	89	81-122	
Chloroethane	ug/L	50	47.2	94	39-148	
Chloroform	ug/L	50	43.4	87	73-127	
Chloromethane	ug/L	50	41.9	84	44-146	
cis-1,2-Dichloroethene	ug/L	50	44.4	89	74-124	
cis-1,3-Dichloropropene	ug/L	50	41.3	83	72-132	
Dibromochloromethane	ug/L	50	42.7	85	78-125	
Dibromomethane	ug/L	50	46.3	93	82-120	
Ethylbenzene	ug/L	50	44.2	88	79-121	
Iodomethane	ug/L	100	85.6	86	39-154	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

LABORATORY CONTROL SAMPLE: 1615385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	44.9	90	64-133	
Styrene	ug/L	50	44.5	89	84-126	
Tetrachloroethene	ug/L	50	45.4	91	78-122	
Toluene	ug/L	50	43.2	86	80-121	
trans-1,2-Dichloroethene	ug/L	50	46.3	93	71-127	
trans-1,3-Dichloropropene	ug/L	50	41.5	83	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	36.0	72	40-160	
Trichloroethene	ug/L	50	44.0	88	78-122	
Trichlorofluoromethane	ug/L	50	44.8	90	53-137	
Vinyl acetate	ug/L	100	84.6	85	40-160	
Vinyl chloride	ug/L	50	49.1	98	58-137	
Xylene (Total)	ug/L	150	131	87	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			105	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 1615386

Parameter	Units	92277227001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	18.7	93	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	19.2	96	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	17.4	87	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.0	95	70-130	
1,1-Dichloroethane	ug/L	ND	20	19.6	98	70-130	
1,1-Dichloroethene	ug/L	ND	20	20.8	104	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	18.0	90	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.5	98	70-130	
1,2-Dichloroethane	ug/L	ND	20	18.0	90	70-130	
1,2-Dichloropropane	ug/L	ND	20	18.4	92	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	19.9	99	70-130	
2-Butanone (MEK)	ug/L	ND	40	38.0	95	70-130	
2-Hexanone	ug/L	ND	40	35.7	89	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	38.2	95	70-130	
Acetone	ug/L	ND	40	38.9	97	70-130	
Acrylonitrile	ug/L	ND	100	91.2	91	70-130	
Benzene	ug/L	ND	20	20.4	102	70-148	
Bromochloromethane	ug/L	ND	20	20.0	100	70-130	
Bromodichloromethane	ug/L	ND	20	17.6	88	70-130	
Bromoform	ug/L	ND	20	15.6	78	70-130	
Bromomethane	ug/L	ND	20	11.5	58	70-130	M1
Carbon disulfide	ug/L	ND	20	20.2	101	70-130	
Carbon tetrachloride	ug/L	ND	20	20.4	102	70-130	
Chlorobenzene	ug/L	ND	20	19.4	97	70-146	
Chloroethane	ug/L	ND	20	20.4	102	70-130	
Chloroform	ug/L	ND	20	19.0	95	70-130	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

MATRIX SPIKE SAMPLE: 1615386

Parameter	Units	92277227001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	16.6	83	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.1	100	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	17.4	87	70-130	
Dibromochloromethane	ug/L	ND	20	16.9	85	70-130	
Dibromomethane	ug/L	ND	20	19.4	97	70-130	
Ethylbenzene	ug/L	ND	20	19.4	97	70-130	
Iodomethane	ug/L	ND	40	19.8	49	70-130	M1
Methylene Chloride	ug/L	ND	20	20.1	101	70-130	
Styrene	ug/L	ND	20	18.7	94	70-130	
Tetrachloroethene	ug/L	ND	20	19.4	97	70-130	
Toluene	ug/L	ND	20	19.3	97	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.1	105	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	16.9	85	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	10.3	51	70-130	M1
Trichloroethene	ug/L	ND	20	19.3	97	69-151	
Trichlorofluoromethane	ug/L	ND	20	20.1	101	70-130	
Vinyl acetate	ug/L	ND	40	28.7	72	70-130	
Vinyl chloride	ug/L	ND	20	22.3	111	70-130	
1,2-Dichloroethane-d4 (S)	%				97	70-130	
4-Bromofluorobenzene (S)	%				103	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1615387

Parameter	Units	92277227002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

SAMPLE DUPLICATE: 1615387

Parameter	Units	92277227002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	95	95	0		
4-Bromofluorobenzene (S)	%	104	100	4		
Toluene-d8 (S)	%	98	98	0		

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: WET/41589 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92277227001, 92277227002, 92277227003

METHOD BLANK: 1613762 Matrix: Water
Associated Lab Samples: 92277227001, 92277227002, 92277227003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	11/24/15 16:50	

LABORATORY CONTROL SAMPLE: 1613763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	125	131	105	90-110	

SAMPLE DUPLICATE: 1613764

Parameter	Units	92276570001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	217	218	0	5	

SAMPLE DUPLICATE: 1613765

Parameter	Units	92277140006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: WET/41609 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92277227004, 92277227005, 92277227006

METHOD BLANK: 1615289 Matrix: Water
Associated Lab Samples: 92277227004, 92277227005, 92277227006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	11/25/15 14:00	

LABORATORY CONTROL SAMPLE: 1615290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	252	101	90-110	

SAMPLE DUPLICATE: 1615291

Parameter	Units	92277227004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	569	576	1	5	

SAMPLE DUPLICATE: 1615292

Parameter	Units	92277499004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	297000 ug/L	270	10	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-6 **Lab ID: 92277227001** Collected: 11/20/15 09:50 Received: 11/23/15 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0638 ± 0.451 (0.900)** **C:NA T:96%**	pCi/L	12/07/15 11:16	13982-63-3	
Radium-228	EPA 904.0	**0.791 ± 0.384 (0.666)** **C:86% T:83%**	pCi/L	12/07/15 18:21	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-8 **Lab ID: 92277227002** Collected: 11/20/15 12:55 Received: 11/23/15 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.16 ± 0.729 (0.958) C:NA T:93%**	pCi/L	12/07/15 10:58	13982-63-3	
Radium-228	EPA 904.0	**0.702 ± 0.338 (0.578) C:86% T:91%**	pCi/L	12/07/15 18:21	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-7 **Lab ID: 92277227003** Collected: 11/20/15 14:20 Received: 11/23/15 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.856 ± 0.633 (0.857)** **C:NA T:90%**	pCi/L	12/07/15 11:38	13982-63-3	
Radium-228	EPA 904.0	**1.15 ± 0.437 (0.652)** **C:83% T:80%**	pCi/L	12/07/15 18:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: MW-1 **Lab ID: 92277227004** Collected: 11/20/15 17:45 Received: 11/23/15 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.414 ± 0.430 (0.640)** **C:NA T:90%**	pCi/L	12/07/15 11:49	13982-63-3	
Radium-228	EPA 904.0	**0.511 ± 0.304 (0.561)** **C:85% T:92%**	pCi/L	12/07/15 18:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: AMBIENT/FIELD BLANK **Lab ID: 92277227005** Collected: 11/20/15 17:40 Received: 11/23/15 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.472 ± 0.579 (0.951) C:NA T:97%**	pCi/L	12/07/15 11:17	13982-63-3	
Radium-228	EPA 904.0	**0.439 ± 0.319 (0.621) C:85% T:88%**	pCi/L	12/07/15 18:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Sample: EQUIPMENT BLANK **Lab ID: 92277227006** Collected: 11/20/15 18:00 Received: 11/23/15 08:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.342 ± 0.521 (0.897)** **C:NA T:94%**	pCi/L	12/07/15 11:29	13982-63-3	
Radium-228	EPA 904.0	**0.961 ± 0.410 (0.661)** **C:87% T:78%**	pCi/L	12/07/15 18:22	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: RADC/27067 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006

METHOD BLANK: 991464 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.819 ± 0.350 (0.563) C:87% T:89%	pCi/L	12/07/15 18:21	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

QC Batch: RADC/27034 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92277227001, 92277227002, 92277227003, 92277227004, 92277227005, 92277227006

METHOD BLANK: 990405 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.204 ± 0.536 (0.967) C:NA T:94%	pCi/L	12/07/15 10:28	

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QUALIFIERS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-G	Pace Analytical Services - Greenwood
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92277227

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92277227001	**MW-6**	EPA 300.0	GWD/2700		
92277227002	**MW-8**	EPA 300.0	GWD/2700		
92277227003	**MW-7**	EPA 300.0	GWD/2700		
92277227004	**MW-1**	EPA 300.0	GWD/2700		
92277227005	**AMBIENT/FIELD BLANK**	EPA 300.0	GWD/2700		
92277227006	**EQUIPMENT BLANK**	EPA 300.0	GWD/2700		
92277227001	**MW-6**	EPA 3010	MPRP/20122	EPA 6010	ICP/18151
92277227002	**MW-8**	EPA 3010	MPRP/20122	EPA 6010	ICP/18151
92277227003	**MW-7**	EPA 3010	MPRP/20122	EPA 6010	ICP/18151
92277227004	**MW-1**	EPA 3010	MPRP/20122	EPA 6010	ICP/18151
92277227005	**AMBIENT/FIELD BLANK**	EPA 3010	MPRP/20122	EPA 6010	ICP/18151
92277227006	**EQUIPMENT BLANK**	EPA 3010	MPRP/20122	EPA 6010	ICP/18151
92277227001	**MW-6**	EPA 7470	MERP/8711	EPA 7470	MERC/8370
92277227002	**MW-8**	EPA 7470	MERP/8711	EPA 7470	MERC/8370
92277227003	**MW-7**	EPA 7470	MERP/8711	EPA 7470	MERC/8370
92277227004	**MW-1**	EPA 7470	MERP/8711	EPA 7470	MERC/8370
92277227005	**AMBIENT/FIELD BLANK**	EPA 7470	MERP/8712	EPA 7470	MERC/8371
92277227006	**EQUIPMENT BLANK**	EPA 7470	MERP/8712	EPA 7470	MERC/8371
92277227001	**MW-6**	EPA 8260	MSV/34440		
92277227002	**MW-8**	EPA 8260	MSV/34440		
92277227003	**MW-7**	EPA 8260	MSV/34440		
92277227004	**MW-1**	EPA 8260	MSV/34440		
92277227005	**AMBIENT/FIELD BLANK**	EPA 8260	MSV/34440		
92277227006	**EQUIPMENT BLANK**	EPA 8260	MSV/34440		
92277227007	**TRIP BLANK**	EPA 8260	MSV/34440		
92277227001	**MW-6**	EPA 903.1	RADC/27034		
92277227002	**MW-8**	EPA 903.1	RADC/27034		
92277227003	**MW-7**	EPA 903.1	RADC/27034		
92277227004	**MW-1**	EPA 903.1	RADC/27034		
92277227005	**AMBIENT/FIELD BLANK**	EPA 903.1	RADC/27034		
92277227006	**EQUIPMENT BLANK**	EPA 903.1	RADC/27034		
92277227001	**MW-6**	EPA 904.0	RADC/27067		
92277227002	**MW-8**	EPA 904.0	RADC/27067		
92277227003	**MW-7**	EPA 904.0	RADC/27067		
92277227004	**MW-1**	EPA 904.0	RADC/27067		
92277227005	**AMBIENT/FIELD BLANK**	EPA 904.0	RADC/27067		
92277227006	**EQUIPMENT BLANK**	EPA 904.0	RADC/27067		
92277227001	**MW-6**	SM 2540C	WET/41589		
92277227002	**MW-8**	SM 2540C	WET/41589		
92277227003	**MW-7**	SM 2540C	WET/41589		
92277227004	**MW-1**	SM 2540C	WET/41609		
92277227005	**AMBIENT/FIELD BLANK**	SM 2540C	WET/41609		
92277227006	**EQUIPMENT BLANK**	SM 2540C	WET/41609		

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Pace Analytical	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: November 17, 2015 Page 1 of 2*
	Document Number: **F-CHR-CS-003-rev.16.1**	Issuing Authority: Pace Huntersville Quality Office

Client Name: HDR

* Page 2 of 2 is for Internal Use Only

Courier: ☐ Fed Ex ☐ UPS ☐ USP ☐ Client ☐ Commercial ☐ Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Optional
Proj. Due Date:
Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun T1505 **Type of Ice:** Wet Blue None ☐ Samples on ice, cooling process has begun

Temp Correction Factor No Correction

Corrected Cooler Temp.: 20 °C **Biological Tissue is Frozen:** Yes No N/A

Date and Initials of person examining contents: 11-23-15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☐No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☑No ☐N/A	15.
Trip Blank Present:	☑Yes ☐No ☐N/A	16.
Trip Blank Custody Seals Present	☑Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

CURF Review: [signature] Date: 11/23/15

SRF Review: [signature] Date: 11/23/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92277227

92277227

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995473

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HDR	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Charrah-Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #: 7672-1

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Radium 226/228	Metals	VOC (8260)	TDS	Chloride/Sulfate	Fluoride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92277227
1	MW-6		G			11/20/15	0950		11										3	2	3	1	1	1		001
2	MW-8		G			11/20/15	1255		11										3	2	3	1	1	1		002
3	MW-7		G			11/20/15	1420		11										3	2	3	1	1	1		003
4	MW-1		G			11/20/15	1745		11										3	2	3	1	1	1		004
5																										
6	Ambient/Field Blank		G			11/20/15	1740		11										3	2	3	1	1	1		005
7	Equipment Blank		G			11/20/15	1800		11										3	2	3	1	1	1		006
8	Trip Blank		G			11/20/15			2												2					007
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	11/20/15	1915	Frank L @ PACE	11-23-15	8:25				
	Frank L @ PACE	11-23-15	12:00	Cleaux P [illegible]	11-23-15	1200	2.00	✓	✓	✓

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 11/20/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: ~~Charah Brickhaven~~ HDR Location: Mancure, NC Project Name/#: Charah - Brickhaven

Name and Afiliation (Sampler(s)): C.S, J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 75.55 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 59.53 ft Casing Volume: 2.61126 gallons

Height of Water Column: 16.02 ft Cal. 3 Volumes: 7.83378 gallons

Purge Information

Date Purged: 11/20/15 Start Time: 1540 Finish: 1745 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 12500 mL ~~gallons~~

Sampling Information

Date Collected: 11/20/15 Time Collected: 1745 am ~~pm~~

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		metals x2, VOC (8260) x3
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 17.7 Time: 1745 Turbidity (ntu): 9.79 Time: 1745

Sample pH (s.u.): 6.91 Time: Diss Oxy (mg/L): 0.06 Time: 1745

Specific Cond. (uS): 939 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): -54.0 Time: Other: Iron, O, Chrom Time: 1745

Odor: None Time: Appearance: Cloudy → clear

General/Weather Observations

Need key. Broke lock, fenced area, muddy area, OK access

Sampler Signature/Date: [signature] / 11/20/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1545	7.14	569.5	-71.0	456.8	3.08	18.0	500mL	59.70
1555	7.13	563.3	-67.7	152.0	2.41	18.0	1500mL	59.72
1605	7.13	562.4	-68.6	157.6	2.21	18.1	2500mL	59.72
1615	7.11	573.4	-83.9	84.04	1.70	18.0	3500mL	59.75
1625	7.07	634	-75.9	57.22	1.18	18.0	4500mL	59.78

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Monroe, NC

Project: Charrah - Brickhaven

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1635	7.04	682	-73.4	41.21	1.05	18.0	5500mL	59.79
1645	7.01	732	-74.9	36.22	1.08	17.9	6500mL	59.76
1655	6.99	758	-75.1	39.14	0.92	18.1	7500mL	59.75
1705	6.97	793	-71.5	28.19	0.73	18.0	8500mL	Stable
1715	6.96	808	-69.3	27.28	0.75	17.9	9500mL	
1725	6.92	880	-62.5	14.12	0.07	17.7	10500mL	
1735	6.90	925	-56.3	12.18	0.06	17.7	11500mL	
1745	6.91	939	-54.0	9.79	0.06	17.7	12500mL	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: Charah-Brickhaven Location: Monroe, NC Project Name/#: Charah-Brickhaven

Name and Afiliation (Sampler(s)): C.S, J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-6 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 27.93 ft Multi Factor*: 0.630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 7.13 ft Casing Volume: 3.3904 gallons

Height of Water Column: 20.8 ft Cal. 3 Volumes: 10.1712 gallons

Purge Information

Date Purged: 11/20/15 Start Time: 0925 Finish: 0950 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 2500 ml ~~gallons~~

Sampling Information

Date Collected: 11/20/15 Time Collected: 0950 am ~~pm~~

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		Metals x2, VOC (8260)x3,
		Fluoride, Chloride/
		Sulfate, TDS

Field Measurements/Observations

Sample Temp (°C): 17.9 Time: 0950 Turbidity (ntu): 2.79 Time: 0950

Sample pH (s.u.): 6.64 Time: Diss Oxy (mg/L): 0.20 Time: 0950

Specific Cond. (uS): 1489 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 114.2 Time: Other: Iron 0.0 mg/L Time: 0950

Odor: None Time: Appearance: Clear

General/Weather Observations

Down side of bank (walk). Previously dewatered / re-developed very little recharge

Sampler Signature/Date: [signature] 11/20/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
0930	6.53	1511	164.6	4.94	0.42	17.7	500ml	7.59
0935	6.64	1574	152.6	4.35	0.27	17.9	1000ml	7.70
0940	6.64	1518	143.1	2.90	0.22	17.7	1500ml	7.80
0945	6.65	1508	128.6	2.53	0.22	17.8	2000ml	7.85
0950	6.64	1489	114.2	2.79	0.20	17.9	2500ml	7.85

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ____
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Charrah/Brickhaven

Name and Afiliation (Sampler(s): CS, J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 17.64 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 9.18 ft Casing Volume: 1.37898 gallons

Height of Water Column: 8.46 ft Cal. 3 Volumes: 4.13694 gallons

Purge Information

Date Purged: 11 / 20 / 15 Start Time: 1350 Finish: 1420 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 3000 mL gallons

Sampling Information

Date Collected: 11/20/15 Time Collected: 1420 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		metals x2, VOC (8260)x3,
		TDS Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 18.1 Time: 1420 Turbidity (ntu): 0.87 Time: 1420

Sample pH (s.u.): 6.61 Time: Diss Oxy (mg/L): 5.00 Time: 1420

Specific Cond. (uS): 2198 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 163.8 Time: Other: Iron: 0.0 mg/L Time: 1420

Odor: None Time: Appearance: Clear

General/Weather Observations

Near operating grading equipment. Muddy area. No recharge

Sampler Signature/Date: [signature] 11/20/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level: (ft)
1355	6.68	2180	150.5	1.51	5.00	18.3	500mL	9.27
1400	6.66	2178	152.4	0.83	4.99	18.3	1000mL	9.45
1405	6.63	2177	156.6	0.65	5.06	18.2	1500mL	9.75
1410	6.62	2178	159.0	0.70	5.00	18.2	2000mL	9.90
1415	6.62	2183	161.5	0.96	5.00	18.2	2500mL	10.00

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Mercure, NC

Project: Cherrah - Brickhaven

Well ID: MW-7

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
1420	6.61	2198	163.8	0.87	5.00	18.1	3000ml	water level: CFP 10.20

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Chorrah - Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-8 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 49.68 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 35.21 ft Casing Volume: 2.35861 gallons

Height of Water Column: 14.47 ft Cal. 3 Volumes: 7.07583 gallons

Purge Information

Date Purged: 11 / 20 / 15 Start Time: 1100 Finish: 1255 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 11,500 ~~gallons~~ mL

Sampling Information

Date Collected: 11/20/15 Time Collected: 1255 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		metals x2, VOC (8260) x3,
		Fluoride, Chloride/Sulfate,
		TDS

Field Measurements/Observations

Sample Temp (°C): 18.1 Time: 1255 Turbidity (ntu): 9.85 Time: 1255

Sample pH (s.u.): 6.70 Time: Diss Oxy (mg/L): 1.89 Time: 1255

Specific Cond. (uS): 3391 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 118.6 Time: Other: Iron: 0.0 mg/L Time: 1255

Odor: None Time: Appearance: Clear

General/Weather Observations

Grading equipment in operation nearby. muddy clay area. Little recharge

Sampler Signature/Date: [signature] /11/20/15

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level (ft)
1105	6.62	4046	124.1	122.0	3.18	16.6	500mL	35.95
1115	6.63	4050	119.4	65.11	2.69	17.0	1500mL	35.90
1125	6.63	4013	122.3	49.00	2.83	17.4	2500mL	Stable
1135	6.65	3921	122.4	41.38	2.48	17.7	3500mL	Stable
1145	6.65	3841	121.0	42.18	2.44	17.6	4500mL	Stable

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Monroe, NC

Project: Charlotte - Brickhaven

Well ID: MW-8

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level (ft)
1155	6.66	3802	123.7	34.25	2.33	17.9	5500 mL	Stable
1205	6.67	3712	123.6	29.95	2.26	17.8	6500mL	Stable
1215	6.68	3609	122.8	22.99	2.18	17.8	7500mL	Stable
1225	6.68	3538	121.4	17.93	2.05	17.9	8500mL	
1235	6.69	3491	118.4	13.33	1.99	17.9	9500mL	
1245	6.70	3441	118.4	11.32	1.91	18.0	10,500mL	
1250	6.70	3406	118.9	9.89	1.90	18.0	11,000mL	
1255	6.70	3391	118.6	9.85	1.89	18.1	11,500mL	

440 S Church Street, Suite 1000
Charlotte, NC 28202-2075
704.338.6700
NC License F0116

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NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Green Meadows - Charah, Inc.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Michael Plummer, P.E. Phone: 704-338-6843

E-mail: Michael.Plummer@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Brickhaven No. 2 Mine Tract "A"	1271 Moncure-Flatwood Road Chatham County Moncure, North Carolina	1910-STRUCT-2015	CAMA	January 4-7, 2016

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Michael Plummer, P.E. | Project Manager | 704-338-6843

Facility Representative Name (Print) | Title | (Area Code) Telephone Number

Signature | 05/26/2016 Date | Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 5/26/16

HDR Engineering, Inc. of the Carolinas; 440 S. Church St. Suite 1000; Charlotte, NC 28202

Facility Representative Address

F0116

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

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Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Green Meadows - Charah, Inc.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Michael Plummer, P.E. Phone: 704-338-6843

E-mail: Michael.Plummer@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Brickhaven No. 2 Mine Tract "A"	1271 Moncure-Flatwood Road Chatham County Moncure, North Carolina	1910-STRUCT-2015	CAMA	February 16-18, 2016

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Michael Plummer, P.E. | Project Manager | 704-338-6843

Facility Representative Name (Print) | Title | (Area Code) Telephone Number

05/26/2016

Signature | Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 5/26/16

HDR Engineering, Inc. of the Carolinas; 440 S. Church St. Suite 1000; Charlotte, NC 28202

Facility Representative Address

F0116

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

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- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Green Meadows - Charah, Inc.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Michael Plummer, P.E. Phone: 704-338-6843

E-mail: Michael.Plummer@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Brickhaven No. 2 Mine Tract "A"	1271 Moncure-Flatwood Road Chatham County Moncure, North Carolina	1910-STRUCT-2015	CAMA	April 5-7, 2016

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Michael Plummer, P.E. | Project Manager | 704-338-6843

Facility Representative Name (Print) | Title | (Area Code) Telephone Number

05/26/2016

Signature | Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 5/26/16

HDR Engineering, Inc. of the Carolinas; 440 S. Church St. Suite 1000; Charlotte, NC 28202

Facility Representative Address

F0116

NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

First Semi-Annual 2016 Groundwater, Surface Water and Leachate Monitoring Report

Brickhaven No.2 Mine Tract “A” Structural Fill

Charah, Inc.

Moncure, Chatham County, North Carolina

May 17, 2016

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List of Acronyms

µg/L	micrograms per liter
asl	above sea level
CAMA	North Carolina Coal Ash Management Act of 2014
CCP	Coal Combustion Products
EPA	United States Environmental Protection Agency
ft/ft	feet / foot
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCGPS	North Carolina groundwater protection standard
NTU	Nephelometric turbidity units
msl	mean sea level
PVC	polyvinyl chloride
TDS	total dissolved solids
USGS	U.S. Geological Survey

1 Introduction

1.1 Purpose

This *First Semi-Annual 2016 Groundwater, Surface Water and Leachate Monitoring Report* addresses results from the 4th, 5th, and 6th events of the eight required sampling events at the Brickhaven No.2 Mine Tract "A" Structural Fill site in Moncure, Chatham County, North Carolina.

Groundwater monitoring and sampling prior to, during, and post-disposal of coal combustion products (CCPs) into the previously clay mined pits of the site shall be conducted in accordance with the following:

- Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729, ratified by North Carolina General Assembly)
- Water Quality Monitoring Plan Brickhaven No.2 Mine Tract "A" Structural Fill, approved March 2015.
- North Carolina Department of Environmental Quality (NCDEQ)[1]Permit No. 1910-STRUC-2015, issued June 5, 2015.
- NCDEQ Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling, April 2008.
- NCDEQ Division of Water Management memorandum concerning electronic document submittal for routine groundwater and surface water monitoring, November 5, 2014.
- U.S. Environmental Protection Agency (EPA) Region I, *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*, January 19, 2010.

Per the approved permits and water quality monitoring plan, a minimum of eight groundwater monitoring events will be conducted at site over the course of one year, concluding on or about August 2016. A minimum of one independent background sample prior to placement of ash was specified in the permit to construct/operate.

The first sampling event occurred on August 12, 2015 and was addressed in detail in the *Initial Background Groundwater and Surface Water Monitoring Event Report* prepared by Buxton Environmental, Inc. (Buxton) on October 28, 2015. The 2nd and 3rd sampling events commenced on October 15, 2015 and November 18, 2015, respectively; these sampling events were addressed in detail in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* prepared by HDR Engineering of the Carolinas, Inc. (HDR) on December 31, 2015. The 1st and 2nd sampling events occurred prior to the placement of ash on October 23, 2015 and represent pre-existing site conditions. The 4th, 5th, and 6th sampling events commenced on January 4, February 16, and April 5, 2016, respectively. The results of the 4th, 5th, and 6th sampling events are described herein.

[1] Prior to September 18, 2015, the NCDEQ was referred to as the North Carolina Department of Environment and Natural Resources (NCDENR). Both naming conventions are used in this report, as appropriate.

1.2 Regulatory Background

CAMA Section §130A-309.216 requires implementation of a groundwater monitoring system as described in the requirements as follows:

"§ 130A-309.216. Design, construction, and siting requirements for projects using coal combustion products for structural fill.

(b) Liners, Leachate Collection System, Cap, and Groundwater Monitoring System Required for Large Structural Fills. –

(4) A groundwater monitoring system, that shall be approved by the Department and, at a minimum, consists of all of the following:

a. A sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the relevant point of compliance as approved by the Department. A down-gradient monitoring system shall be installed at the relevant point of compliance so as to ensure detection of groundwater contamination in the uppermost aquifer.

b. A proposed monitoring plan, which shall be certified by a licensed geologist or professional engineer to be effective in providing early detection of any release of hazardous constituents from any point in a structural fill or leachate surface impoundment to the uppermost aquifer, so as to be protective of public health, safety, and welfare; the environment; and natural resources.

c. A groundwater monitoring program, which shall include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and down-gradient wells. Monitoring shall be conducted through construction and the post-closure care period. The sampling procedures and frequency shall be protective of public health, safety, and welfare; the environment; and natural resources.

d. A detection monitoring program for all Appendix I constituents. For purposes of this subdivision, the term "Appendix I" means Appendix I to 40 C.F.R. Part 258, "Appendix I Constituents for Detection Monitoring," including subsequent amendments and editions.

e. An assessment monitoring program and corrective action plan if one or more of the constituents listed in Appendix I is detected in exceedance of a groundwater protection standard."

On April 17, 2015, EPA published its final rule *Disposal of Coal Combustion Residuals from Electric Utilities* to regulate the disposal of CCP as solid waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA). Among other requirements, the final rule established requirements for a groundwater monitoring program consisting of detection monitoring and, if necessary, assessment monitoring and corrective action. EPA selected constituents for

detection monitoring that are present in CCP, would be expected to migrate rapidly, and would thereby provide early detection as to whether contaminants were migrating from the disposal unit (80 FR 74: 21397).

As stated in the Federal Register (80 FR 74: 21342)

> *These detection monitoring constituents or inorganic indicator parameters are: boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS). These inorganic indicator parameters are known to be leading indicators of releases of contaminants associated with CCR and the Agency strongly recommends that State Directors add these constituents to the list of indicator parameters to be monitored during detection monitoring of groundwater if and when a MSWLF decides to accept CCR.*

Groundwater analytical results for the constituents in 40 CFR 257, Appendix III detection monitoring and 40 CFR 257, Appendix IV assessment monitoring are included below.

Constituents for detection monitoring listed in 40 CFR 257 Appendix III are:

- Boron
- Calcium
- Chloride
- Fluoride
- pH
- Sulfate
- Total dissolved solids (TDS)

Constituents for assessment monitoring listed in 40 CFR 257 Appendix IV includes:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury
- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

Aluminum, copper, iron, manganese, and sulfide were included in the Appendix IV constituents in the draft rule; EPA removed these constituents in the final rule. Therefore, these constituents are not included.

1.2.1 Site Specific Regulatory Background

In accordance with CAMA, the *Water Quality Monitoring Plan* (Buxton, 2015a) for the site was designed to effectively provide early detection of any release, as to be protective of human health and the environment. The *Design Hydrogeologic Report* (HDR, 2014*)* specified a groundwater monitoring network would comprise of seven downgradient/side-gradient monitoring wells and one upgradient background monitoring well. Four pre-existing piezometers (PZM-1, PZM-22, PZM-27, and PZM-28) were to be converted to monitoring wells (MW-4, MW-5, MW-7, and MW-8, respectively); PZM-28 remained dry during investigations and was unable to be utilized for monitoring well MW-8 as originally specified. PZM-28 was subsequently abandoned in accordance with North Carolina standards and its abandonment was documented in the *Report of Abandonment of Piezometer PZM-28,* submitted to NCDEQ on October 5, 2015. Therefore, only MW-4, MW-5, and MW-7 were successfully converted to monitoring wells during the August through December 2015 time period (**Table 1**).

Four downgradient/side-gradient compliance monitoring wells (MW-2, MW-3, MW-6, and MW-8 replacement) and one upgradient background monitoring well (MW-1) were installed from June 19 through July 30, 2015. On July 17, 2015, Mr. Ross Klingman, P.G. with Buxton, contacted Ms. Elizabeth Werner, Permitting Hydrogeologist with NCDEQ SWS, via telephone to request the installation of an additional background monitoring well (BG-1). The additional background well would assist with current background and future semi-annual groundwater quality monitoring at the site. During the conversation, Ms. Werner verbally approved the installation of the additional background monitoring well (Buxton, 2015b).

1.3 Site Location, Operation and Background

The site is located in Chatham County, approximately four miles southwest of central Moncure, North Carolina (**Figure 1**). The owner of the site is Green Meadow, LLC (Green Meadow) and Charah, Inc. (Charah) is responsible for the operation and maintenance of the site. The mine property is approximately 301 acres in total; the structural fill area for CCP placement will comprise of approximately 145 acres; and the fill area including associated perimeter berms, channels, and haul roads encompasses 166 acres. The remaining acreage is still utilized for clay mining activities.

The property located within the structural fill area was previously owned by General Shale Brick, Inc., which operated the site as a clay mine since 1985 for their off-site brick manufacturing facility. Mined clay was stockpiled and then transported approximately 3.5 miles south to Brickhaven, North Carolina for brick manufacturing.

The area immediately surrounding the site primarily consists of rural residential (approximately 2,500 feet east, 1,000 feet southeast and 1,000 feet southwest), commercial, industrial, wooded and agricultural property. According to information obtained from the Chatham County GIS website, municipal water supply is available to the surrounding area.

Charah began CCP placement in the first composite liner containment system (Cell 1, Subcell 1A) on October 23, 2015. Charah plans to place approximately 1,600,000 tons of CCP per year in the 12,000,000 ton structural fill capacity; therefore, the placement phase should last approximately eight years or less depending of importation rate. CCPs (including fly ash, bottom ash, boiler slag, and/or flue gas desulfurization materials) are brought to the site by truck, rail, or combination thereof, from the Duke Energy Carolinas (DEC) Riverbend Steam Station and Duke Energy Progress (DEP) L.V. Sutton Energy Complex (Sutton Plant) sites. CCPs could eventually be brought to the site from other DEC and/or DEP sites.

Leachate (i.e. product generated from the liquids present in the fill at the time of placement and/or stormwater that infiltrates the fill) is managed on-site through collection, storage, and disposal of the resultant liquid. Green Meadow LLC has an approved pump and haul permit to dispose of leachate at either the City of Sanford's Big Buffalo Creek Wastewater Treatment Plant or to VLS Recovery Services LLC in Mauldin, South Carolina. In addition to the first leachate sample initially collected during the 3rd Round Sampling Event (HDR, 2015), leachate samples were subsequently collected during the 4th through 6th sampling events; analytical leachate results are discussed in **Section 3.3**.

1.4 Site Topography and Geographical Setting

According to the 1993 USGS topographic quadrangle (**Figure 2**), the topography of the site and immediately surrounding area can be characterized by moderately rolling hills, which are dissected by dendritic creeks. The northwestern portion of the site generally slopes to the north and northwest from three topographically high ridges with interconnected saddles ranging from approximately 260 to 270 feet above sea level (asl), towards off-site intermittent tributary. The southeastern portion of the site generally slopes to the southeast, south and west from the three topographic high ridges with similar interconnected saddles ranging from approximately 260 to 270 feet asl, towards on-site intermittent tributary creeks that drain from the southern property boundary at approximately 205 feet asl.

1.5 Geologic and Hydrogeologic Setting

1.5.1 Regional Geology

The site is located within the Piedmont physiographical province of North Carolina, which is a northeast-southwest trending region extending from New York to Alabama.

According to the 1985 North Carolina Geologic Map prepared by the North Carolina Geological Survey, the site is located in the Triassic Basin Belt of the Piedmont physiographic province. The basement rocks of the Triassic Basin Belt include conglomerate, sandstone, mudstone, limestone, coal, and shale. The majority of the subject property is located within the Sanford Formation which contains conglomerate, fanglomerate, sandstone, and mudstone. The far western portion of the site is located in the Cummock Formation which contains sandstone, mudstone, gray and black coal, and carbonaceous shale. The Triassic Basin is bounded by felsic metavolcanic rock within the Carolina Slate Belt approximately 6.5 miles to the northwest; and is contacted by metamorphosed granite and by biotite gneiss and schist of the Raleigh Belt along a normal fault approximately 2.5 miles to the southeast. The Triassic Basin formations

have been intruded by north northwest-south southeast trending igneous diabase dikes during the Jurassic Period (~144 to 208 Ma), and contain northeast-southwest trending normal faults, however, none of these were indicated to exist at the subject site on the 1985 geologic map (NCDENR, 1985).

In the Piedmont, the bedrock is typically overlain by a mantle of weathered rock (residuum/saprolite), which has an average thickness of approximately 25 feet. The residuum/saprolite consists of varying amounts of unconsolidated clays, silts and sands, with lesser amounts of rock fragments. Due to the range of the parent rock composition and the variable susceptibility to weathering of each rock type, the residuum/saprolite ranges widely in color, texture and thickness. Generally, the residuum/saprolite is thickest near inter-stream divides (ridges) and thins toward stream beds. In profile, the residuum/saprolite normally grades from clayey soils near the land surface to sandier, partially weathered rock above the competent bedrock (Buxton, 2014).

1.5.2 Regional Hydrogeology

The occurrence and movement of groundwater in the Piedmont physiographic province is within two separate but interconnected water-bearing zones that typically comprise one aquifer. A shallow water-bearing zone occurs within the residuum/saprolite and a deeper zone within the underlying bedrock.

Groundwater in the residuum/saprolite zone occurs in the interstitial pore spaces between the individual grains comprising the residuum/saprolite. Groundwater in this zone is typically under water table conditions and generally flows from topographic highs to topographic lows. The occurrence and movement of groundwater in the underlying bedrock zone is controlled by joints and fractures within the bedrock. Groundwater within this deeper zone may occur under confined or semi-confined conditions, depending on the extent of fracturing at the saprolite/bedrock interface. Deeper groundwater movement is typically controlled by the distribution of openings in the bedrock and can be variable.

No naturally occurring springs or creeks with actively flowing water recharged by the subsurface aquifer were observed within the site boundary during this reporting period.

2 Sampling Procedures

2.1 Groundwater Sampling Procedures

A total of eight monitoring wells, one background monitoring well, and two surface water samples were collected on three separate occasions in 2015 and three separate occasions in the first half of 2016, to date (**Figure 3**). Two remaining sampling events will be conducted prior to August 2016 in compliance of the site's Water Quality Monitoring Plan. The 1st and 2nd monitoring events (August 12, 2015 and October 15, 2015 respectively) occurred prior to the placement of ash at the site on October 23, 2015 and therefore constitute pre-existing site conditions. The 3rd monitoring event (November 18, 2015) occurred after the placement of CCP. A single leachate sample was collected during each of the 3rd through 6th monitoring events. The 1st monitoring event was conducted by Buxton; the 2nd through 6th monitoring events were

conducted by Pace Analytical Services, Inc. Field data sheets and sampling logs along with the analytical laboratory results for the 4th through 6th monitoring events are provided in **Appendices A, B, and C**. Analytical laboratory results for the first through 3rd monitoring events were included under separate cover in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015).

Prior to commencing groundwater sampling, new plastic sheeting was placed around the well head, in order to prevent the sampling equipment from contacting the ground surface. The well lock was then removed from the protective stand-up-cover. New nitrile gloves were donned and static groundwater levels were obtained from below the measuring point (top-of-well polyvinyl chloride (PVC) casing) at each monitoring well to the nearest 0.01 foot with a depth-to-water electrode at each monitoring well. Low flow purging and sampling was conducted utilizing a stainless-steel Proactive SS Mega Monsoon pump with flow rate controller, which was plumbed to new polyethylene sample tubing (1/2-inch outer diameter (OD) 3/8-inch inner diameter (ID)). In the event of low recharge a peristaltic pump was utilized to purge and sample the well. The base of the pump was set at approximately two feet off the bottom depth above the well base to reduce turbidity. The following information was recorded at timed intervals during the purging process: 1) water levels (below top of casing), 2) purge flow rate, 3) purge rate and cumulative water pumped, and 4) field parameters. Temperature, conductivity, pH, oxygen reduction potential (ORP), and dissolved oxygen (DO) were recorded with a Horiba U-52 meter; and turbidity was recorded with a Micro-TPW meter. The Horiba U-52 and Micro-TPW meters were rented and calibrated by Enviro-Equipment, Inc. of Pineville, North Carolina for the first monitoring event. Horiba U-52 and Micro-TPW/LaMotte turbidity meters, property of Pace Analytical, were calibrated prior to use and on-site during the sampling events.

Purging was conducted until a minimum of three well volumes of water had been removed and the below field parameters requirements have been met and stabilized. All measurements, except turbidity, were obtained using a flow-through-cell, while turbidity measurements are obtained before water enters the flow-through-cell.

- Turbidity (10% for values greater than 5 NTU (if three turbidity values are less than 5 NTU, the values are considered stabilized)
- DO (10% for values greater than 0.5 mg/L, if three DO values are less than 0.5 mg/L, the values are considered stabilized)
- Specific conductance (3%)
- Temperature (3%)
- pH ($\pm$ 0.1 unit)
- ORP ($\pm$ 10 millivolts)

If field parameters had stabilized prior to purging three well volumes, or the well was going dry, groundwater samples were then collected. The water level meter and low flow pump were decontaminated in the field with a distilled water rinse, Alconox® wash, and a distilled water rinse, prior to and following sampling at each monitoring well. Following sampling, locks were

placed back on the well stand-up covers. Purge water was discharged to the ground surface at respective well heads.

All samples for this current reporting period were shipped under proper management and Chain of Custody (COC) procedures to Pace Analytical Services, Inc. laboratory in Huntersville, North Carolina (Cert IDs #37706 and #5342). Sample handling and custody was performed according to the EPA Guidance for Field Samplers.

2.2 Surface Water Sampling Procedures

Surface water samples were collected from two locations outside of the structural fill boundary to provide for potential groundwater to surface water interactions and evaluation of potential off-site impacts. The SW-1 sampling location is downgradient of the site, approximately 3,000 feet south of the structural fill boundary along an unnamed tributary of Gulf Creek. The SW-2 sampling location is upgradient of the site, approximately 3,200 feet west of the structural fill boundary along Shaddox Creek. Approximate surface water sampling locations are depicted on **Figure 4**.

New nitrile gloves were donned prior to collecting surface water samples. Field parameters (including temperature, conductivity, pH, ORP, and DO) were recorded with a Horiba U-52 meter; turbidity was recorded with a Micro-TPW meter.

Gulf Creek and Shaddox Creek are classified as Class WS-IV Waters by NCDEQ and as such are evaluated under North Carolina Surface Water and Wetland Standards (15A NCAC 02B).

3 Results

Groundwater analytical results for the constituents in 40 CFR 257 Appendix III detection monitoring and 40 CFR 257 Appendix IV assessment monitoring (as previously discussed in **Section 1.2**) were compared to background concentrations to determine if any impact to groundwater is indicated. If any impact to groundwater is inferred from groundwater detection monitoring or if a potential impact is detected, Charah must notify NCDEQ of any exceedance(s) within 14 days. In the event no exceedances are observed, Charah must submit a report of the sampling results to NCDEQ with 120 days of the sampling event.

Groundwater samples were also analyzed for constituents of assessment monitoring (EPA 40 CFR 257 Appendix IV). Assessment monitoring typically occurs if a statistically significant increase in a detection monitoring constituent is noted and will be further assessed in subsequent reporting. Appendix IV constituents were analyzed for background events and will continue to be assessed during future monitoring events. Groundwater monitoring samples were also analyzed for 40 CFR Part 258 Appendix I metals and volatile organic compounds (VOCs). Iron and manganese, two constituents often attributable to weathering of Piedmont parent material, were not analyzed during testing.

A summary of the laboratory parameters detected during the 4th through 6th monitoring events, along with the highest detected concentration result, is provided in the sections below. Field and Sampling Logs are provided in **Appendix A**. Full laboratory data from the 4th through 6th

monitoring events is provided in **Appendix B** and electronic data deliverables (EDDs) in **Appendix C**.

3.1 Groundwater Analytical Results

3.1.1 Background Site Conditions Summary

Pre-CCP Placement groundwater site conditions (i.e. laboratory analysis from the first and second monitoring events) generally exhibited high background chloride and TDS concentrations. Several monitoring wells additionally showed exceedances of NC 2L Standards for antimony, barium, chromium, cobalt, copper, and vanadium.

Bromodichloromethane and dibromochloromethane detected above NCGPS in groundwater samples from MW-2, MW-3, and MW-7 during the first monitoring event were the result of municipal water utilized during previous development activities. These trihalomethanes were only detected in the first sampling event; all VOCs were non-detect for the second through 6th sampling events. VOCs are not present at naturally occurring background concentrations at the site.

A detailed discussion of background groundwater conditions can be found in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015).

3.1.2 Conditions Following CCP Placement

CCP placement began at the site on October 23, 2015; four monitoring events (3rd through 6th rounds) have been conducted following CCP placement. The 3rd monitoring event was discussed in detail in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015); the primary focus of this section is the analytical results of Rounds 4 through 6.

The eight monitoring wells and single background monitoring well continue to show consistently elevated chloride and TDS which was also observed in pre-CCP placement (Rounds 1 and 2) and immediately following CCP placement (3rd Round). In Rounds 4 through 6, antimony, arsenic, barium, chromium, thallium, vanadium and pH additionally showed several intermittent exceedances that were similarly noted in both pre-CCP placement monitoring events (Rounds 1 and 2). Naturally occurring metals exceeding NCGPS are common in North Carolina due to various geologic conditions (i.e. weathering of crystalline parent material). pH levels were detected below NCGPS in MW-4 (6.33 to 6.40 SU) for all six monitoring events and appear to be the result of naturally occurring conditions.

Ranges of constituent concentrations for Rounds 3 through Round 6 are given below. The monitoring well location of the highest concentration and the sampling event in which the concentration was detected for a given constituent is provided in parentheses. Data packages are included in **Appendix B** with EDDs in **Appendix C**. A summary of the findings from the 4th through 6th monitoring events is provided below and in **Table 6-1** through **Table 6-3**:

EPA Appendix III Constituent Detections (Post-CCP Placement Site Conditions)

- Boron: 5.5 to 49.4 µg/L (MW-7 – 3rd Round)

- Calcium: 10,100 to 207,000 µg/L (MW-2 – 5th Round)
- Chloride: 18,000 to 1,280,000 µg/L (MW-3 – 5th Round)
- Fluoride: <20 to 590 µg/L (MW-5 – 3rd Round)
- pH: 6.30 to 7.95 SU
- Sulfate: 3,100 to 247,000 µg/L (MW-2 – 5th Round)
- Total Dissolved Solids: 194,000 to 2,700,000 µg/L (MW-2 – 6th Round)

EPA Appendix IV Constituent Detections (Post-CCP Placement Site Conditions)

- Antimony: <3.8 to 10.8 µg/L (MW-3 – 5th Round)
- Arsenic: <2.50 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Barium: 86 to 1,550 µg/L (MW-8 – 3rd Round)
- Beryllium: <0.5 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Cadmium: <0.5 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Chromium: <2.50 µg/L to 23.7 µg/L (MW-2 – 5th Round)
- Cobalt: <2.50 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Lead: <2.50 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Lithium: 6.3 µg/L to 217 µg/L (MW-3 – 6th Round)
- Mercury: <0.10 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Molybdenum: <2.50 µg/L to 21.1 µg/L (MW-2 – 3rd Round)
- Selenium: <5.0 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Thallium: <5.0 µg/L to 14.8 µg/L (MW-5 – 5th Round)
- Radium-226: 0.0638J to 1.16 pCi/L (MW-8 – 3rd Round)
- Radium-228: 0.174J to 1.95J pCi/L (MW-3 – 3rd Round)

EPA Appendix I Metal Detections (Post-CCP Placement Site Conditions)

- Copper: <2.5 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Nickel: <2.5 µg/L to 13.5 (MW-2 – 5th Round)
- Silver: <2.5 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Vanadium: <2.5 µg/L to 6.2 µg/L (MW-1 – 4th Round)
- Zinc: <5.0 µg/L to 50.7 (MW-2 – 3rd Round)

EPA Appendix I VOC Detections (Post-CCP Placement Site Conditions)

- 1,4-Dichlorobenzene: <0.33 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Acetone: <10.0 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Bromodichloromethane: <0.18 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Bromoform: <0.26 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Carbon Disulfide: <1.20 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Chloroform: <0.14 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Dibromochloromethane: <0.21 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds
- Dibromomethane: <0.21 µg/L in all wells for 3rd, 4th, 5th, and 6th Rounds

Laboratory analytical results from the 3rd Round generally showed a decrease or remained constant in groundwater TDS concentrations in all monitoring wells. TDS concentrations increased for the three subsequent sampling events (4th, 5th and 6th Rounds) and returned to levels similarly observed during pre-CCP placement (1st and 2nd Rounds) Kevin Godwin, Project Manager of Pace Analytical, verified the 3rd Round sampling, analytical, and quality control procedures were performed in accordance with all other monitoring events.

Elevated thallium concentrations were detected during the 4th and 5th Rounds, relative to the four other monitoring events. Exceedances were detected in MW-6 and MW-7 during the 4th Round and in BG-1, MW-2, MW-5, and MW-8 in the 5th Round. Thallium was non-detect for all monitoring wells during the 6th Round.

Radium-226 and Radium-228 were detected in all wells during the 3rd Round of sampling, but were estimated at concentrations below the laboratory minimum detection limit (MDL), and were not detected in any of the other five samplings events.

3.2 Surface Water Analytical Results

Surface water samples prior to and following CCP placement had few constituents above established North Carolina Surface Water and Wetland Standards (15A NCAC 02B) or EPA National Criteria standards (utilized by North Carolina Division of Water Quality as default standards for non listed parameters). Laboratory analytical results from the 4th Round of sampling indicated thallium in surface water samples SW-1 (12.9 µg/L) and SW-2 (11.4 µg/L) were in exceedance of the 15A NCAC 2B standard. No other surface water exceedances were detected during the 4th Round of sampling. Results from the 5th Round of sampling indicated cobalt (13.1 µg/L), TDS (614,000 µg/L), lead (37.3 µg/L), copper (24.5 µg/L) and zinc (91.1 µg/L) in SW-1 and thallium (13.9 µg/L) in SW-2 were in exceedence of their respective 15A NCAC 2B standards. No detections above the 15A NCAC 2B standards were observed during the 6th Round of surface water sampling.

3.3 Leachate Analytical Results

Leachate generated on-site was collected during the 3rd through 6th monitoring events to geochemically characterize the nature of CCP leachate (**Figure 5**). Leachate parameter concentrations are evaluated against the NC Groundwater Protection Standards. EPA Appendix III parameters generally increased from the 3rd through 6th Rounds but were within the standard. EPA Appendix IV and EPA Appendix I metals parameters remained stable or also increased slightly. Antimony, arsenic, and selenium were in exceedance during the 5th and 6th Rounds, and chromium was in exceedance for the 4th Round. Vanadium was in exceedance for the 4th through 6th Rounds.

3.4 Groundwater Flow Characteristics

Prior to each of 4th Round through 6th Round sampling events, a synoptic event occurred to establish depth-to-water below top of casing for the seven monitoring wells, one upgradient monitoring well, and one background monitoring well. Depths-to-water ranged from 5.8 feet below top of casing (MW-4; February 16, 2016) to 58.3 feet below top of casing (MW-1; April 5, 2016). Groundwater elevations ranged from 197.2 mean sea level (msl) (MW-2; January 4, 2016) to 230.1 msl (MW-5; January 4, 2016). Round 4 experienced the highest median groundwater elevation in 2016. The greatest groundwater elevation change observed between Round 4 through Round 6 events occurred at MW-5 (230.1 msl on January 4, 220.1 msl on April 5, 2016; an approximate 10 foot drop in three months). Due to on-site linear construction and storm water pond construction, groundwater levels have fluctuated during this reporting period.

3.4.1 Groundwater Direction

Groundwater generally flows toward the southeastern portion of the site, although radial flow away from two topographic high points is depicted on **Figure 6**. A potentiometric surface map for groundwater elevations measured during April 2016 event is shown in **Table 2** and on **Figure 6**.

3.4.2 Hydraulic Conductivity

Hydraulic conductivity is the capacity of a porous medium to transmit water (K, coefficient of permeability). This property is primarily dependent upon the size, shape, and interconnectedness of pores, and is governed secondarily by the properties of the fluid (i.e., viscosity, a temperature-dependent phenomenon). Horizontal hydraulic conductivity of aquifer materials adjacent to the well screen was estimated through in-situ slug testing. On September 10, 2015, Buxton conducted rising head slug tests at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8, to determine hydraulic conductivity (Buxton, 2015b). Results are provided in **Table 3**.

Prior to conducting slug tests, static water levels were obtained at each well to the nearest one-hundredth of a foot (0.01 feet) with an electronic water level indicator. Slug tests were conducted by lowering one or two disposable PVC bailer(s) attached to new nylon rope below the water level at each well. Water levels were allowed to equilibrate to near static conditions (at least 90% recharge). A slug of water was then removed from the well by withdrawing the bailer(s) and water levels were measured with time.

The slug and recovery test data were evaluated using AQTESOLV® software developed by Hydrosolv, Inc. (2007) and in accordance with the methods developed by Bouwer and Rice in 1976 and 1987. The Bouwer-Rice method utilized to evaluate the slug test data was developed to determine the hydraulic conductivity of the aquifer immediately surrounding the screened portion of the partially or fully penetrating wells in unconfined aquifers.

Monitoring wells were generally screened within residuum or partially weathered rock; hydraulic conductivity ranged from 4.08E-07 cm/sec at MW-3 (0.422 ft/year) to 4.11E-04 at MW-1 (425.5 ft/year).

3.4.3 Horizontal Hydraulic Gradients

Horizontal hydraulic gradient is calculated by taking the difference in hydraulic head over the length of the flow path between two wells of similar construction; BG-1, MW-1, MW-2, MW-3, MW-6, and MW-8 were installed with 15-foot screens, while MW-4, MW-5, and MW-7 (i.e. converted piezometers) were installed with ten-foot screens. Hydraulic gradients at the site during the sixth round of sampling ranged from 0.001 between MW-1 and MW-6 to 0.013 between MW-1 and MW-2 (**Table 4**).

3.4.4 Groundwater Flow Velocity

Darcy's Law is an equation that describes the flow rate or flux of fluid through a porous media. To calculate the velocity that moves through a porous media, the specific discharge, or Darcy flux, is divided by the effective porosity, P_e. The result is the average linear velocity, or seepage velocity, of groundwater between two points.

The following equation was used to calculate groundwater velocities between specific wells:

$$V_S = \frac{Ki}{P_e}$$

Where:

V_s = seepage velocity
K = horizontal hydraulic conductivity
i = horizontal hydraulic gradient
P_e = effective porosity

Seepage velocities for groundwater were calculated using horizontal hydraulic gradients established in **Section 3.2.3**, horizontal hydraulic conductivity values established in **Section 3.2.2**, and estimated effective porosity values from geotechnical testing and from the literature where geotechnical data was not available. (Buxton, 2014; Sinhal and Gupta, 2010). If geotechnical data was unavailable, an effective porosity of 0.15 was used for wells primarily screened in residuum/PWR and an effective porosity of 0.075 was used for wells primarily screened in layered rock/PWR.

Flow velocity varies with hydraulic conductivity as well as hydraulic gradient and effective porosity of the soil, and therefore this approximated value varies on a well-by-well basis. Throughout the study area, flow velocity ranged from 0.08 feet per year (between MW-5 and MW-7) to approximately 38 feet per year (between MW-1 and MW-8). The site average flow velocity is approximately three feet per year for the evaluated screen intervals. Flow velocity values are summarized in **Table 5**; flow velocity was estimated with the most recent groundwater level measurements (April 5th, 2016).

4 Conclusions

Rounds 4 through 6 of the required eight monitoring events were conducted at Brickhaven No. 2 Mine Tract “A” Structural Fill site from January to April 2016. In conjunction with the 3rd monitoring event discussed in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015), these events represent post-CCP placement conditions at the site. The first and second monitoring events were conducted prior to the placement of CCP on October 23, 2015, and therefore represent pre-existing site conditions; these results were also discussed in detail in the 2015 semi-annual report (HDR, 2015). The requisite one minimum independent background monitoring event specified in Permit No. 1910-STRUC-2015 have thus been met. Two additional monitoring events will occur prior to August 2016 for a total of six post-CCP placement events and two pre-CCP placement events.

A summary of the findings from the 4th through 6th monitoring events is provided below and in **Table 6-1** through **Table 6-3**:

- Groundwater was encountered at the site from approximately six feet below top of casing (MW-4; February 16, 2016) to approximately 60 feet below top of casing (MW-1;

April 5, 2016). Round 4 experienced the highest median groundwater elevation in 2016 thus far.

- Groundwater samples collected at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8 indicated the presence of constituents above established NCGPS.
- Chloride exceeded its NCGPS in several separate wells during the 4th through 6th Rounds. Exceedances of chloride were similarly detected in the background monitoring events (i.e. 1st and 2nd Rounds) and during the first post-CCP placement monitoring event (i.e. Round 3). Chloride is likely naturally occurring due to site geological conditions. MW-5 has not exceeded its NCGPS during any monitoring event in 2015 or 2016.
- TDS consistently exceeded its NCGPS in eight of nine wells, including background well BG-1, during the 4th, 5th, and 6th Rounds. MW-5 has not exceeded its NCGPS for TDS during any monitoring event in 2015 or 2016. A decrease in TDS concentrations during the 3rd Round was noted in the 2015 semi-annual report (HDR, 2015) and was initially attributed to further well development. Subsequent TDS concentrations in the 4th through 6th monitoring events returned to approximately pre-CCP placement levels. Pace Analytical has verified all sampling, analytical, and quality control procedures were followed in accordance with all other sampling events. This short-term decrease in concentrations and exceedances may be associated with the installation of a geosynthetic liner around the time of the 3rd Round. Elevated TDS concentrations remain and are likely naturally occurring throughout the site.
- Groundwater pH was in exceedance in MW-4 for all 4th through 6th monitoring events and was in exceedance in MW-6 for Round 5 and Round 6. Low pH previously observed at BG-1 has stabilized above the NCGPS threshold during the 4th through 6th monitoring events. Intermittently low pH is likely naturally occurring at the site, with several field pH values only slightly above the 6.5 SU threshold for multiple monitoring events; occasional fluctuations around this NCGPS threshold will likely continue.
- Antimony exhibited multiple intermittent exceedances in different wells during the 4th through 6th Rounds, although MW-2, MW-3, and MW-8 exhibited exceedances of antimony for all three rounds. These detection patterns and concentration levels are similar to pre-CCP placement and are likely naturally occurring.
- Thallium exceedances were observed in six separate wells over the 4th and 5th Rounds. Thallium was non-detect for all monitoring wells during the 6th Round.
- Barium, chromium, cobalt, and vanadium exhibited multiple exceedances in different wells during all three monitoring events. These constituents are likely naturally occurring.
- Analytical data from the 4th through 6th monitoring events indicate placement of CCP has not impacted groundwater at the site.
- Surface water collected at two off-site locations exhibited exceedances of thallium during the 4th and 5th Rounds and cobalt and lead during the 5th Round. Analytical data from the 4th through 6th monitoring events indicate surface water has not been impacted by the placement of CCP at the site.
- Leachate samples generally exhibited an increase in exceedance frequency and parameter concentrations relative to the first leachate sample collected in Round 3.

NCGPS exceedances during the 4th through 6th Rounds included antimony, arsenic, chromium, selenium, TDS, and vanadium.

5 Recommendations

Based on the findings of this assessment, HDR makes the following recommendations:

- Groundwater and surface water sampling should continue to be conducted on an approximate 45-day frequency until all eight (8) independent background sampling events have been completed.
- The 7th monitoring event should commence on or before May 25th, 2016, and should include groundwater, surface water, and leachate sampling.

6 References

Buxton Environmental. 2015a. *Water Quality Monitoring Plan for Brickhaven No.2 Mine Tract "A" Structural Fill.*

Buxton Environmental. 2015b. *Compliance Groundwater Well Installation, Development, Surveying and Hydraulic Conductivity Determination Activities Report for Brickhaven No.2 Mine Tract "A" Structural Fill.*

HDR. 2014. *Permit Application for Brickhaven No.2 Mine Tract "A" Structural Fill including Design Hydrogeological Report.*

HDR. 2015. *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report*

North Carolina Department of Natural Resources and Community Development. 1985. *North Carolina Geologic Map.*

North Carolina General Assembly. *Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729).* Ratified.

NCDEQ. 2008. *Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling.*

Singhal, B. B.S. and R. P. Gupta. 2010. *Applied Hydrogeology of Fractured Rocks: Springer, 2nd Edition*, 408p. (Table 8-1, p. 140)

United States Geological Survey. 2004. *Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan.*

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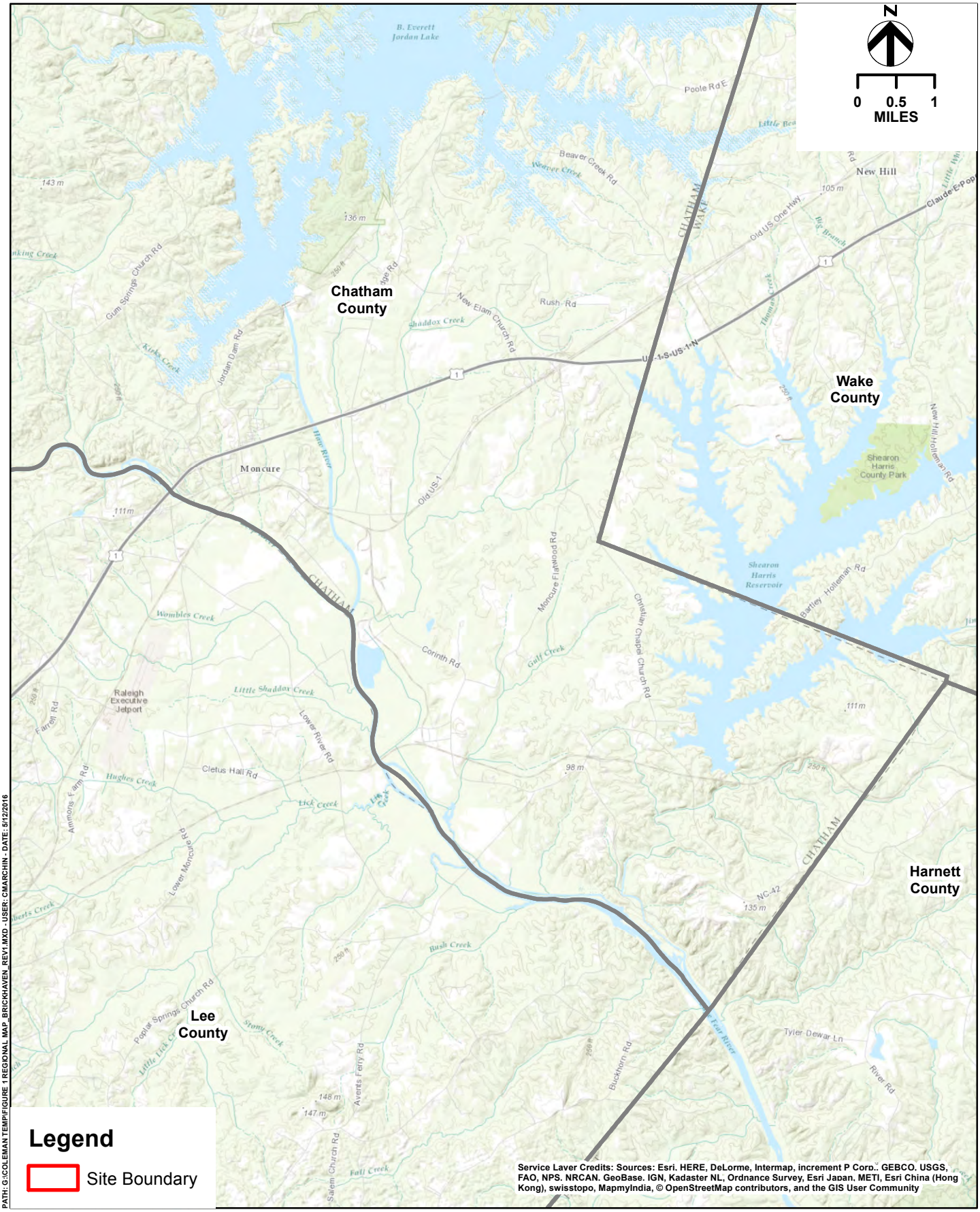
Figures

Figure 1: Regional Site Location Map
Figure 2: Regional USGS Topographic Map
Figure 3: Site Layout Map with Monitoring Wells Locations
Figure 4: Surface Water Sample Location Map
Figure 5: Leachate Sample Collection Location
Figure 6: Potentiometric Surface Map



PATH: G:\COLEMAN TEMP\FIGURE 1 REGIONAL MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 5/12/2016

REGIONAL SITE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

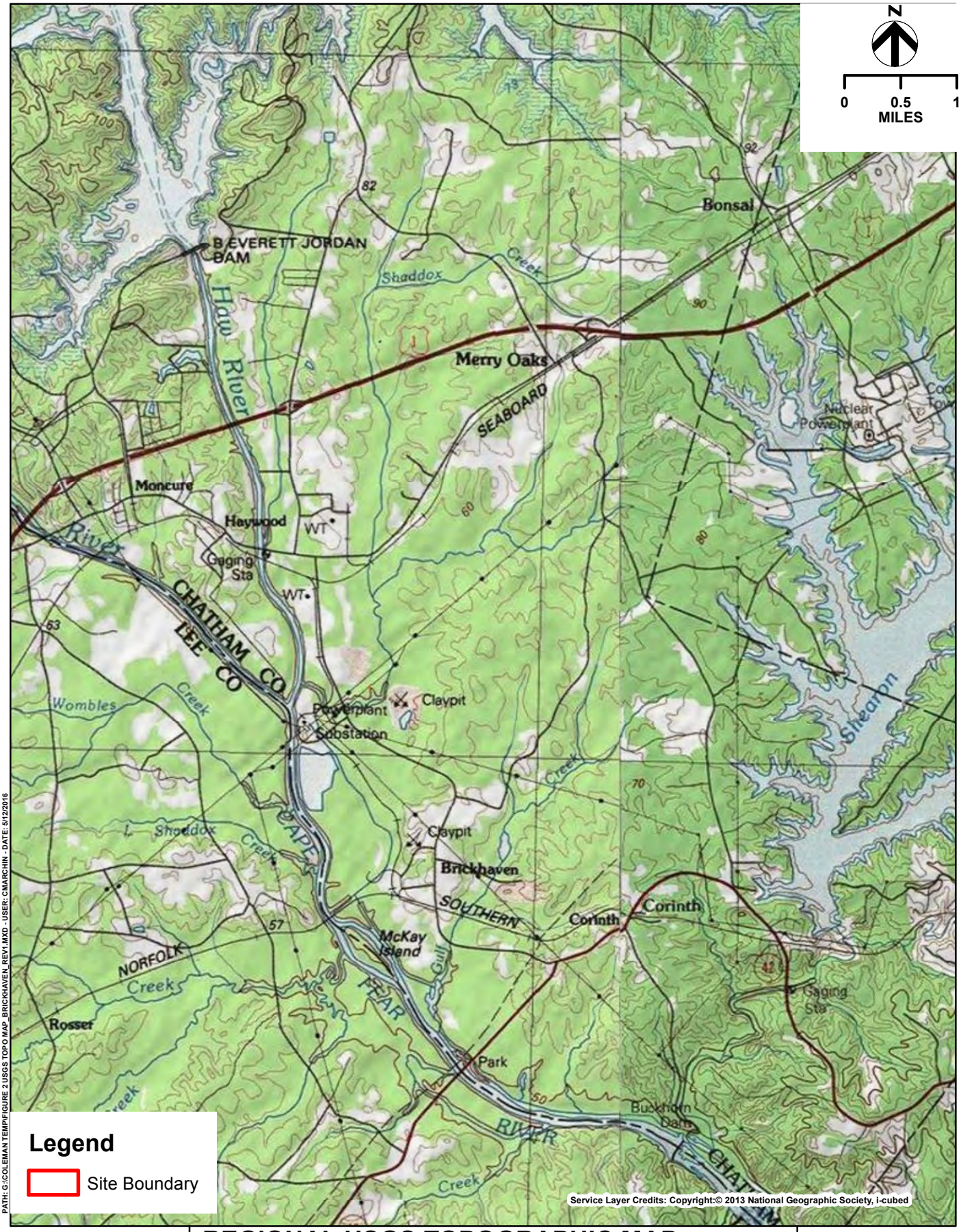
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

MAY 2016

FIGURE

1



PATH: G:\COLEMAN TEMP\FIGURE 2 USGS TOPO MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 5/12/2016

REGIONAL USGS TOPOGRAPHIC MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

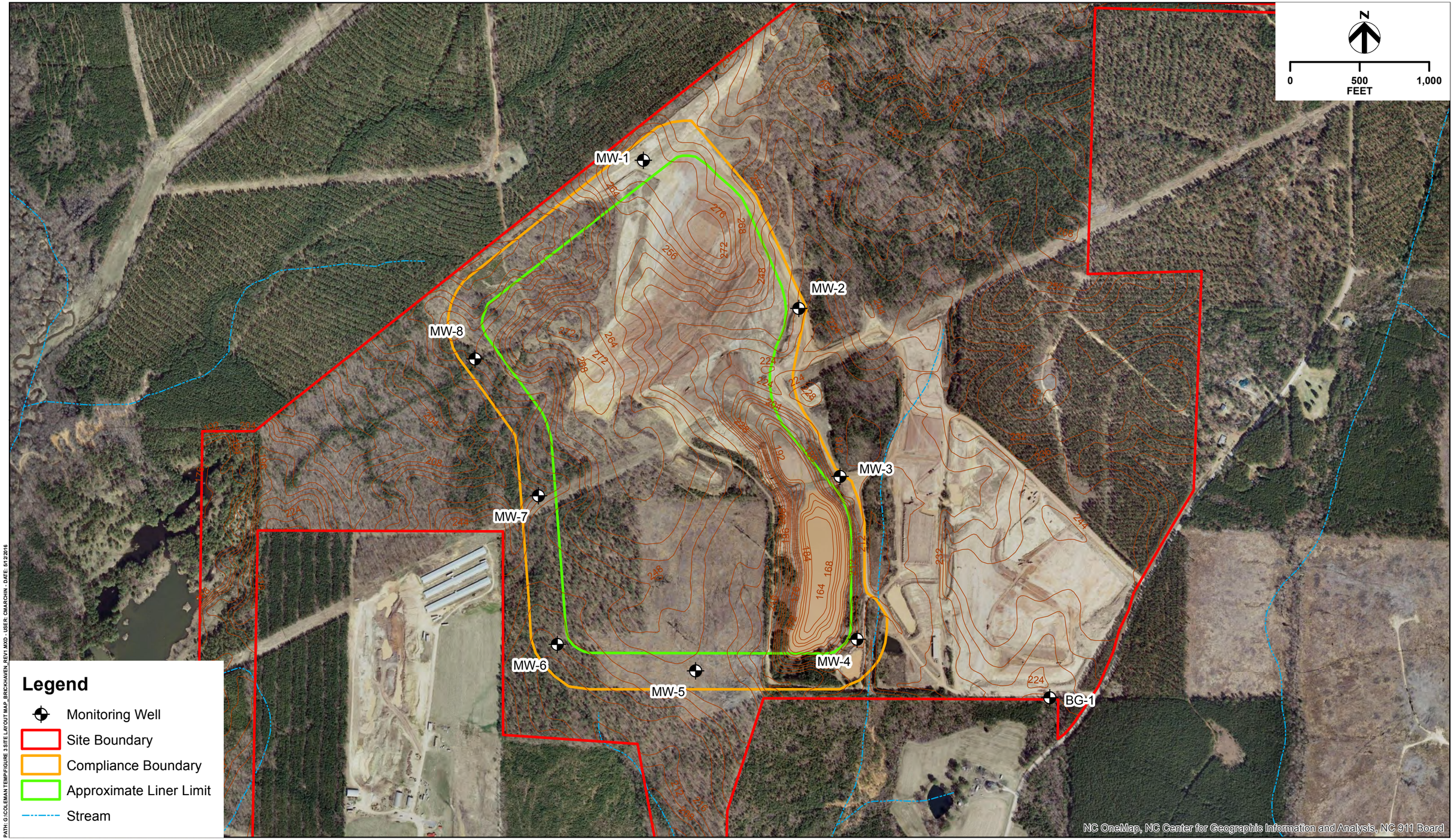
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

MAY 2016

FIGURE

2



PATH: G:\COLEMAN\TEMP\FIGURE 3 SITE LAYOUT MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 6/12/2016

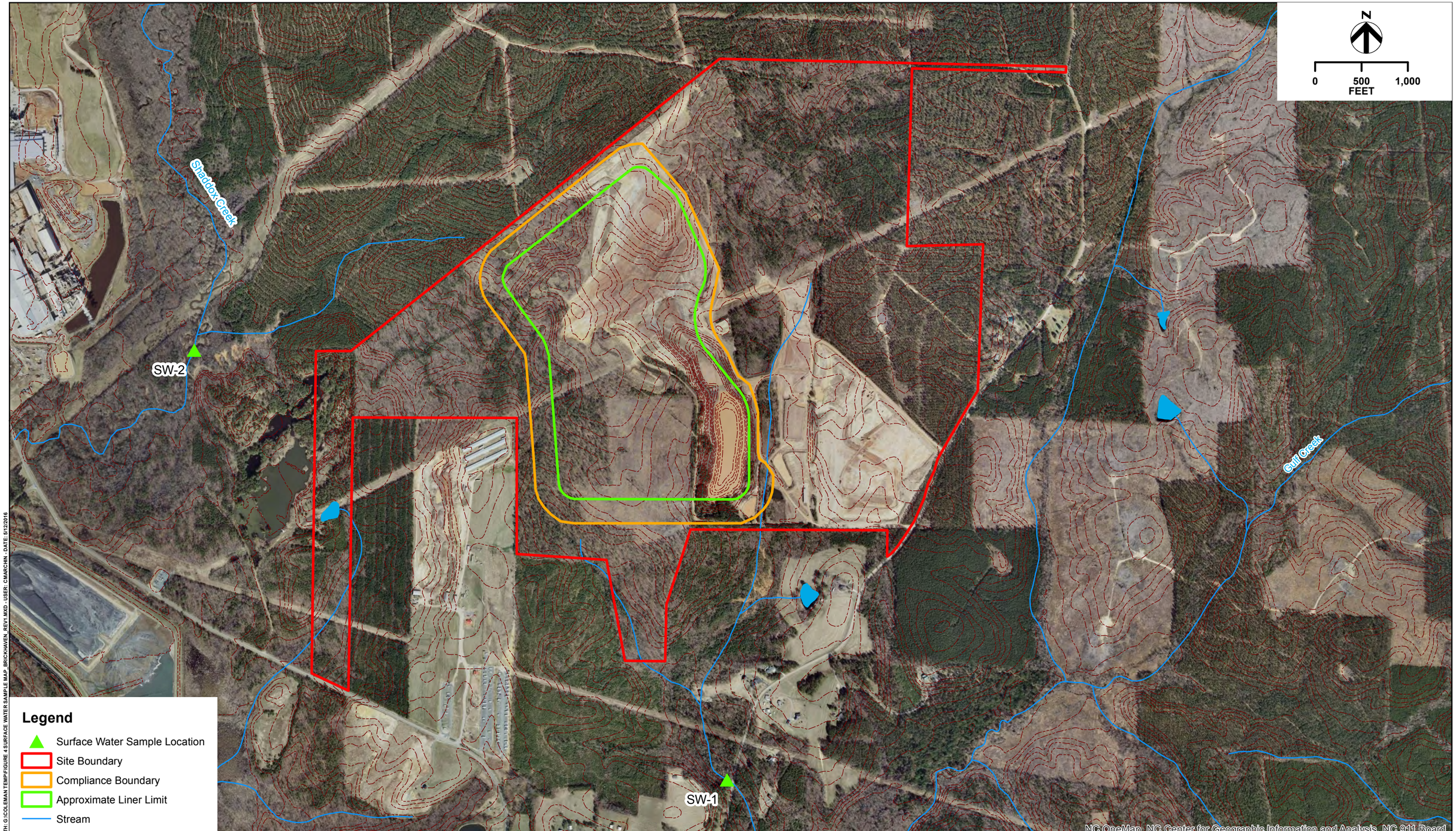
HDR

SITE LAYOUT MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
MAY 2016

FIGURE
3



PATH: S:\COLEMAN\TEMP\FIGURE 4 SURFACE WATER SAMPLE MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 5/12/2016

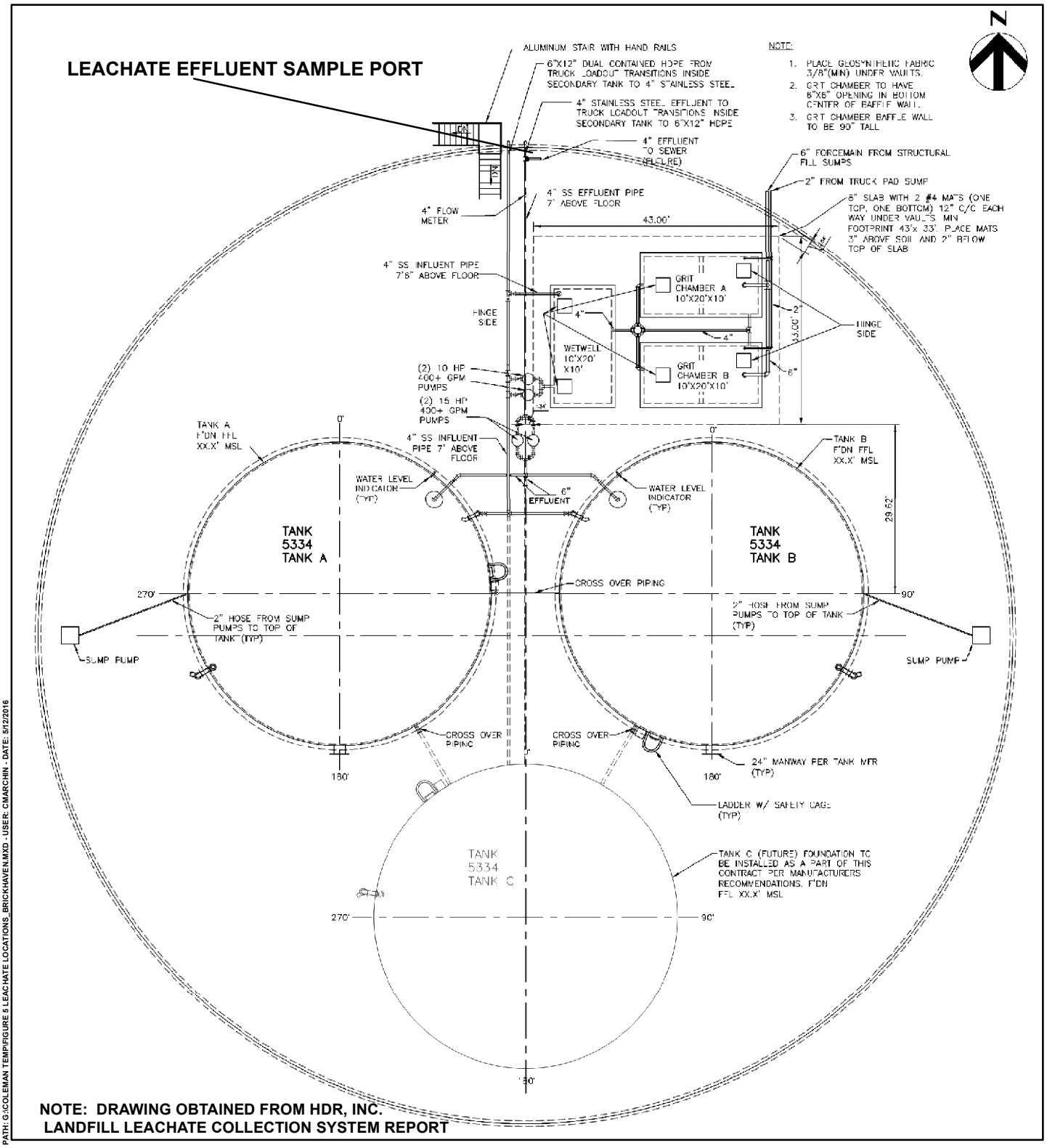
HDR

SURFACE WATER SAMPLE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE MAY 2016

FIGURE 4



NOTE: DRAWING OBTAINED FROM HDR, INC.
LANDFILL LEACHATE COLLECTION SYSTEM REPORT

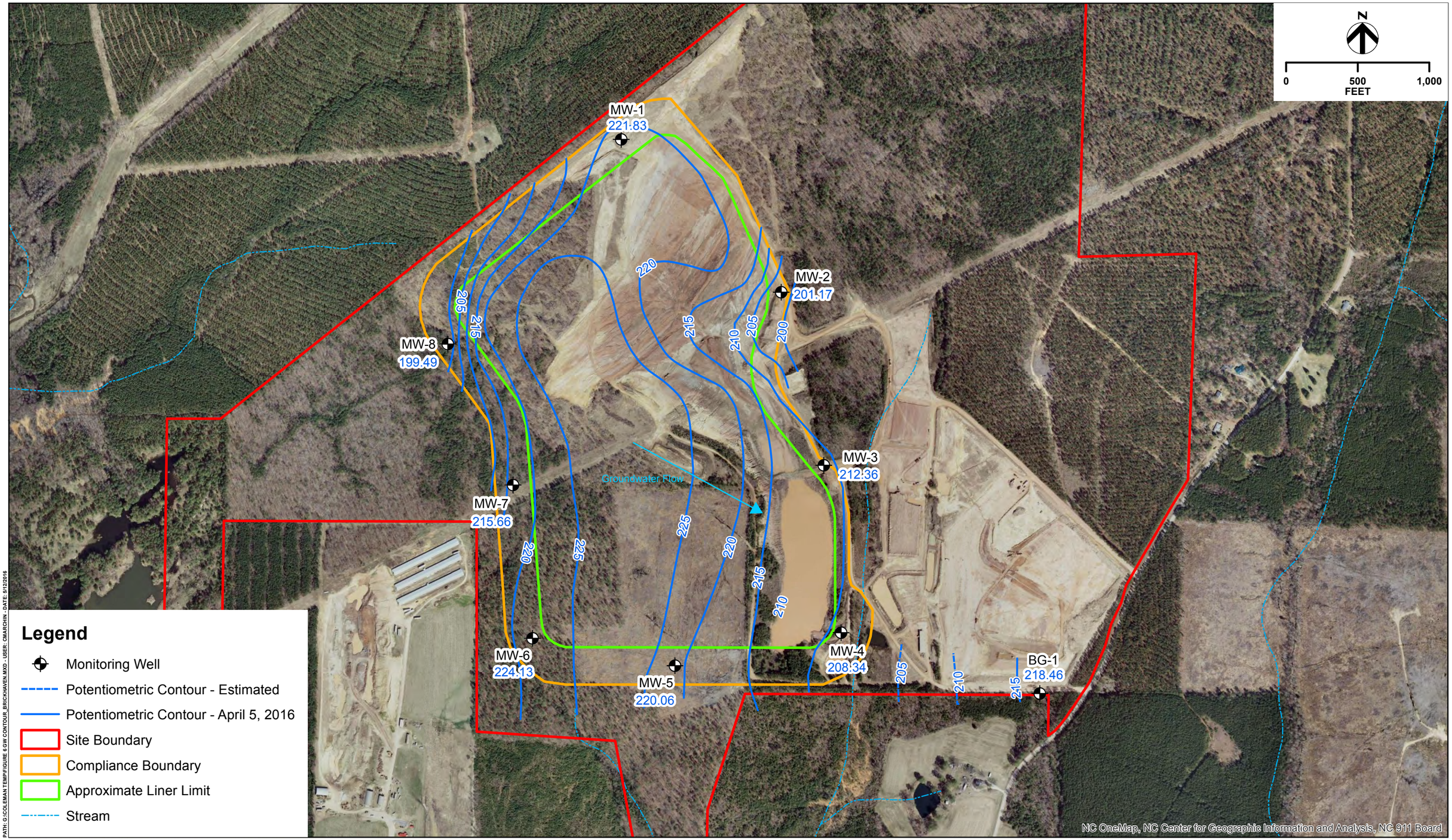
PATH: G:\COLEMAN TEMP\FIGURE 5 LEACHATE LOCATIONS_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 5/12/2016

LEACHATE SAMPLE COLLECTION LOCATION
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
MAY 2016

FIGURE
5



PATH: G:\COLEMAN TEMP\FIGURE 6 GW CONTOUR_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 5/12/2016

Note:
1. Groundwater data was collected by Pace Analytical Services on April 5, 2016.
2. Groundwater elevation of monitoring well MW-2 appears to be anomalously low in relation to surrounding topography and was not used in the potentiometric contouring process.

HDR

POTENTIOMETRIC SURFACE MAP - APRIL 5, 2016
CHARAH, INC,

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
MAY 2016

FIGURE
6

Tables

Table 1: Well Construction and Survey Summary
Table 2: Groundwater Elevations for April 5, 2016
Table 3: Hydraulic Conductivity
Table 4: Hydraulic Gradients
Table 5: Groundwater Flow Velocities
Table 6s: Analyte Detections and Exceedances

Table 1: Well Construction and Survey Summary

Well ID	Northing	Easting	Pad Elev. (msl)	TOC Elev. (msl)	TD BGS (ft)	TD BTOC (ft)	Screen Length (ft)	Screen Interval (msl)	Lithologic Unit
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	Layered Rock/PWR*
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	Layered Rock/PWR*
MW-2	673677.07	1994537.54	227.45	229.97	45.00	47.52	15	197.45 - 182.45	Layered Rock/PWR*
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	PWR
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	Residuum/PWR
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	PWR
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	216.63 - 201.63	Residuum/PWR
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	Residuum/PWR
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	PWR

Notes:

1. Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.
2. Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.
3. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.

* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation

Table 2: Groundwater Elevations
April 5, 2016

Well ID	Screen Interval Elevation (msl)	DTW BTOC (ft)	DTW Elevation (msl)	Lithologic Unit
BG-1	200.14 - 185.14	9.73	218.46	Layered Rock/PWR*
MW-1	220.20 - 205.20	58.25	221.83	Layered Rock/PWR*
MW-2	197.45 - 182.45	28.80	201.17	Layered Rock/PWR*
MW-3	194.20 - 179.20	10.20	212.36	PWR
MW-4	201.79 - 191.79	8.79	208.34	Residuum/PWR
MW-5	208.72 - 198.72	24.80	220.06	PWR
MW-6	216.63 - 201.63	6.97	224.13	Residuum/PWR
MW-7	224.53 - 214.53	16.05	215.66	Residuum/PWR
MW-8	202.41 - 187.41	36.98	199.49	PWR

Notes:

1. Depth to water measurements obtained on April 5, 2016 to the nearest 0.01 foot with a depth-to-water meter by Buxton Environmental, Inc.
2. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.

* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation

Table 3: Hydraulic Conductivity
Slug Testing - September 2015

Well ID	DTW BTOC (ft)	Length of Water Column (ft)	Screen Length (ft)	Screen Interval (msl)	Hydraulic Conductivity (k, cm/sec)	Lithologic Unit
BG-1	12.46	30.59	15	200.14 - 185.14	7.76E-05	Layered Rock/PWR*
MW-1	59.97	15.33	15	220.20 - 205.20	4.11E-04	Layered Rock/PWR*
MW-2	40.98	6.54	15	197.45 - 182.45	3.41E-06	Layered Rock/PWR*
MW-3	15.55	27.81	15	194.20 - 179.20	4.08E-07	PWR
MW-4	11.61	14.04	10	201.79 - 191.79	1.41E-04	Residuum/PWR
MW-5	14.17	32.37	10	208.72 - 198.72	8.01E-06	PWR
MW-6	8.25	21.22	15	216.63 - 201.63	1.10E-04	Residuum/PWR
MW-7	9.11	8.07	10	224.53 - 214.53	1.26E-06	Residuum/PWR
MW-8	36.4	12.66	15	202.41 - 187.41	1.29E-04	PWR

Notes:

1. Depth to water measurements obtained on September, 2015 to the nearest 0.01 foot with a depth-to-water meter by Buxton Environmental, Inc. prior to slug testing.
2. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.
3. Hydraulic conductivity values determined by Buxton Environmental, Inc. on September 10, 2015 by conducting rising head slug tests; and solved utilizing the Bouwer-Rice (unconfined slug test) solution with AQTESOLV for Windows Version 4.50 software by Hydrosolv, Inc. (1996-2007).

* = interpreted lithologic unit based on relative drilling hardness during well installation

Table 4: Horizontal Hydraulic Gradients

Horizontal Hydraulic Gradient (*i* , dh/dl)									
	BG-1	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**
BG-1	-	0.0007				0.001	0.002		
MW-1		-					0.001		
MW-2	0.005	0.01	-	0.01	0.003	0.01	0.01	0.01	
MW-3	0.003	0.004		-		0.00	0.005	0.002	
MW-4	0.007	0.004		0.003	-	0.01	0.007	0.00	
MW-5		0.000482				-	0.003909		
MW-6							-		
MW-7	0.000706	0.002417				0.003	0.007928	-	
MW-8	0.004	0.01	0.00071	0.005	0.003	0.01	0.01	0.01	-

1. Positive horizontal hydraulic gradients calculated by dividing the difference in hydraulic head between a well pair by the lenth of the flow path between the well pair. (*i* = dh/dl)
2. All well pairs assumed to be screened in same surficial aquifer unit
3. Horizontal flow path distance calculated by $\sqrt{(Easting_1 - Easting_2)^2 + (Northing_1 - Northing_2)^2}$
4. Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.
5. Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.
6. Static water level elevations from April 5, 2016 monitoring event. See **Table 2**.

Table 5: Groundwater Flow Velocities

Groundwater Flow Velocity Between Well Pairs (V_s, ft/year)									
	BG-1	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**
BG-1	-	1.7				0.2	1.3		
MW-1		-					1.2		
MW-2	1.4	8.3	-	0.2	0.7	0.6	1.5	0.1	
MW-3	0.3	0.8		-		0.1	0.3	0.0	
MW-4	7.1	8.3		0.3	-	3.1	6.4	0.3	
MW-5		0.4				-	1.06		
MW-6							-		
MW-7	0.1	0.5				0.1	0.64	-	
MW-8	5.5	37.7	0.25	0.6	3.4	3.3	12.6	1.7	-

1. Flow velocities between well pairs estimated by $V_S = \frac{Ki}{P_e}$

   Where: V_s = groundwater flow velocity

   K = horizontal hydraulic conductivity (See **Table 3**)

   i = horizontal hydraulic gradient (See **Table 4**)

   P_e = average effective porosity between given well pairs

2. Effective porosity values from geotechnical testing and the literature (McWhorter and Sunada, 1977; Sinhal and Gupta, 2010) where geotechnical data was not available.

Brickhaven First Semi-Annual 2016 Groundwater, Surface Water, and Leachate Sampling Report

Table 6-1: Analytical Detections and Exceedances
Fourth Round Results
January 2016

		Groundwater Analysis											Quality Control			Surface Water Analysis			Leachate Analysis	
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Amb. Blank	Duplicate (MW-1)	SW-1	SW-2	***NCSWWS***	Leachate-1	***NCGPS***
EPA APPENDIX III																				
Boron (µg/l)	7440-42-8	7.5	9.6	37.8	42	7.2	10.8	8.9	48.3	9.2	*700*	--	ND	ND	9.6	12.7	18.2	*NS*	34.5	*700*
Calcium (µg/l)	7440-70-2	28,600	108,000	188,000	188,000	35,200	13,500	35,600	45,100	162,000	*NS*	*NS*	ND	ND	116,000	4,080	6,220	*NS*	10,700	*NS*
Chloride (µg/l)	16887-00-6	**285,000**	**446,000**	**910,000**	**1,270,000**	**307,000**	21,900	**252,000**	**403,000**	**755,000**	*250,000*	--	ND	ND	**447,000**	7,600	6,700	*250,000*	ND	*250,000*
Fluoride (µg/l)	16984-48-8	130	140	290	260	350	560	410	350	ND	*2,000*	--	ND	ND	130	120	ND	*1,800*	ND	*2,000*
pH* (standard units)	-	6.51	6.71	7.95	7.3	**6.38**	7.00	6.67	6.87	6.81	*6.5-8.5*	--	N/A	N/A	6.71	6.17	6.15	*6.0-9.0*	7.66	*6.5-8.5*
Sulfate (µg/l)	14808-79-8	19,500	11,200	228,000	10,000	6,300	4,100	194,000	32,100	5,500	*250,000*	--	ND	ND	11,000	18,200	9,400	*250,000*	9,900	*250,000*
Total Dissolved Solids (µg/l)	-	**643,000**	**700,000**	**2,480,000**	**2,490,000**	**806,000**	259,000	**946,000**	**1,120,000**	**1,410,000**	*500,000*	--	ND	ND	**950,000**	205,000	72,000	*500,000*	40,000	*500,000*
EPA APPENDIX IV																				
Antimony (µg/l)	7440-36-0	ND	ND	**8.7**	**9.2**	ND	ND	ND	ND	**7.6**	*1*	--	ND	ND	ND	ND	ND	*5.6*	ND	*1*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*	ND	*10*
Barium (ug/l)	7440-39-3	310	220	262	**802**	176	102	140	269	**1,430**	*700*	--	ND	ND	228	82.8	56.1	*1,000*	34.8	*700*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	ND	ND	*6.5*	ND	*4*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	**15.8**	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*50*	ND	*10*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*3*	ND	*1*
Fluoride (µg/l)	16984-48-8	130	140	290	260	350	560	410	350	ND	*2,000*	--	ND	ND	130	0.12	ND	*1,800*	ND	*2,000*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	--	ND	ND	ND	ND	ND	*25*	ND	*15*
Lithium (µg/l)	7439-93-2	15	30.1	144	65.4	23.2	6.4	55.8	21.7	39.6	*NS*	*NS*	ND	ND	30.7	2.40	0.78	*NS*	2.2	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*	ND	*1*
Molybdenum (µg/l)	7439-98-7	ND	ND	18.1	10.9	ND	ND	5.4	6.4	ND	*NS*	*NS*	ND	ND	ND	ND	ND	*160*	ND	*NS*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*	ND	*20*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	**6.2**	**8.0**	ND	*0.28*	--	ND	ND	ND	**12.9**	**11.4**	*0.24*	ND	*0.28*
Radium 226 (pCi/l)	13982-63-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*	*5 (combined)*	ND	ND	ND	ND	ND	*NS*	ND	*NS*
Radium 228 (pCi/l)	15262-20-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*		ND	ND	ND	ND	ND	*NS*	ND	*NS*
EPA APPENDIX I METALS																				
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	ND	ND	*7*	ND	*1,000*
Nickel (µg/l)	7440-02-0	ND	ND	8.70	ND	ND	ND	ND	ND	ND	*100*	--	ND	ND	ND	ND	ND	*88*	ND	*100*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0.06*	ND	*20*
Vanadium (µg/l)	7440-62-2	ND	**6.2**	ND	ND	ND	ND	ND	ND	ND	*0.3*	--	ND	ND	**6.7**	8.9	ND	*NS*	**5.6**	*0.3*
Zinc (µg/l)	7440-66-6	ND	13.3	ND	ND	ND	ND	11.3	ND	18.7	*1,000*	--	ND	ND	13.9	12.8	14.2	*50*	15.2	*1,000*
EPA APPENDIX I VOC'S																				
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*	ND	*6,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*	ND	*0.6*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*	ND	*4*
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*5.6*	ND	*70*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*	ND	*0.4*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*	ND	*700*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*	ND	*70*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*	ND	*6*

Notes:

1. Groundwater, surface water, and leachate samples collected on January 4 through January 6, 2016 and analyzed for above parameters by Pace Analytical Laboratories
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and **shade** denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. pH was field tested by Pace Analytical Laboratories

Brickhaven First Semi-Annual 2016 Groundwater, Surface Water, and Leachate Sampling Report

Table 6-2: Analytical Detections and Exceedances
Fifth Round Results
February 2016

		Groundwater Analysis											Quality Control			Surface Water Analysis			Leachate Analysis	
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Amb. Blank	Dup. (MW-1)	SW-1	SW-2	***NCSWWS***	Leachate-1	***NCGPS***
EPA APPENDIX III																				
Boron (µg/l)	7440-42-8	5.5	10.0	37.4	35.8	5.7	10.2	6.6	35.3	8.7	*700*	--	19	19	9.2	8.6	14.7	*NS*	329	*700*
Calcium (µg/l)	7440-70-2	29,500	57,700	207,000	174,000	35,200	16,900	39,200	47,900	137,000	*NS*	*NS*	ND	ND	68,000	6,630	5,030	*NS*	65,000	*NS*
Chloride (µg/l)	16887-00-6	**277,000**	167,000	**1,190,000**	**1,280,000**	188,000	21,300	242,000	**330,000**	**663,000**	*250,000*	--	ND	ND	208,000	5,500	5,400	*250,000*	7,100	*250,000*
Fluoride (µg/l)	16984-48-8	130	160	220	210	360	550	340	270	ND	*2,000*	--	ND	ND	150	120	ND	*1,800*	130	*2,000*
pH* (standard units)	-	6.52	6.84	7.63	7.22	**6.33**	7.09	**6.35**	6.87	6.82	*6.5-8.5*	--	N/A	N/A	6.84	7.58	6.36	*6.0-9.0*	7.25	*6.5-8.5*
Sulfate (µg/l)	14808-79-8	18,600	8,700	247,000	9,100	5,600	3,600	87,700	40,400	5,600	*250,000*	--	ND	ND	9,300	5,000	4,500	*250,000*	125,000	*250,000*
Total Dissolved Solids (µg/l)	-	**650,000**	**593,000**	**2,470,000**	**2,270,000**	**800,000**	263,000	**783,000**	**950,000**	**1,050,000**	*500,000*	--	72,000	93,000	**660,000**	**614,000**	181,000	*500,000*	315,000	*500,000*
EPA APPENDIX IV																				
Antimony (µg/l)	7440-36-0	ND	ND	**10.7**	**10.8**	**5.0**	ND	ND	ND	**6.5**	*1*	--	ND	ND	ND	ND	ND	*5.6*	**13.5**	*1*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*	**25.6**	*10*
Barium (ug/l)	7440-39-3	354	70	318	**855**	157	129	118	254	**1490**	*700*	--	ND	ND	89.3	438	47.5	*1,000*	205	*700*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	2.1	ND	*6.5*	ND	*4*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	**23.3**	ND	ND	ND	ND	**23.7**	ND	*10*	--	ND	ND	ND	20.4	ND	*50*	**66.4**	*10*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	**13.1**	ND	*3*	ND	*1*
Fluoride (µg/l)	16984-48-8	130	160	220	210	360	550	340	270	ND	*2,000*	--	ND	ND	150	120	ND	*1,800*	130	*2,000*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	--	ND	ND	ND	**37.3**	ND	*25*	ND	*15*
Lithium (µg/l)	7439-93-2	17.1	19.2	88.4	75.5	22.8	6.3	37.1	17.7	33.4	*NS*	*NS*	ND	ND	19.7	1.6	1.5	*NS*	21.7	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*	ND	*1*
Molybdenum (µg/l)	7439-98-7	6.8	ND	19.1	13.8	ND	ND	ND	ND	5.6	*NS*	*NS*	ND	ND	ND	ND	6.3	*160*	110	*NS*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*	**388**	*20*
Thallium (µg/l)	7440-28-0	**13.7**	ND	**10.3**	ND	ND	**14.8**	ND	ND	**8.8**	*0.28*	--	ND	ND	ND	ND	**13.9**	*0.24*	ND	*0.28*
Radium 226 (pCi/l)	13982-63-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*	*5 (combined)*	ND	ND	ND	ND	ND	*NS*	ND	*NS*
Radium 228 (pCi/l)	15262-20-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*		ND	ND	ND	ND	ND	*NS*	ND	*NS*
EPA APPENDIX I METALS																				
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	**24.5**	ND	*7*	ND	*1,000*
Nickel (µg/l)	7440-02-0	ND	ND	13.5	ND	ND	ND	ND	13.2	ND	*100*	--	ND	ND	ND	16.8	ND	*88*	ND	*100*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0*	ND	*20*
Vanadium (µg/l)	7440-62-2	**5.1**	ND	ND	ND	ND	ND	ND	ND	ND	*0.3*	--	ND	ND	ND	61.3	6.1	*NS*	**58.6**	*0.3*
Zinc (µg/l)	7440-66-6	ND	ND	27.2	ND	ND	ND	ND	ND	14.6	*1,000*	--	ND	ND	ND	**91.1**	16.2	*50*	53.6	*1,000*
EPA APPENDIX I VOC'S																				
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*	ND	*6,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*	ND	*0.6*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*	ND	*4*
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*5.6*	ND	*70*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*	ND	*0.4*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*	ND	*700*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*	ND	*70*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*	ND	*6*

Notes:

1. Groundwater, surface water, and leachate samples collected on February 16 through February 18, 2016 and analyzed for above parameters by Pace Analytical Laboratories
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and **shade** denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. Ambient blank samples obtained during each of three days of the 5th Round Monitoring Event. Ambient Blank/equipment blank from 02/17/16 presented above; two remaining ambient blank samples were non-detect for all parameters.
10. pH was field tested by Pace Analytical Laboratories

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Table 6-3: Analytical Detections and Exceedances
Sixth Round Results
April 2016

		Groundwater Analysis											Quality Control			Surface Water Analysis			Leachate Analysis	
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Amb. Blank	Duplicate (MW-1)	SW-1	SW-2	***NCSWWS***	Leachate-1	***NCGPS***
EPA APPENDIX III																				
Boron (µg/l)	7440-42-8	6.0	10.6	47.3	42.7	6.8	12.1	10.8	32.1	8.9	*700.0*	--	ND	ND	9.3	11.2	34.4	*NS*	690	*700*
Calcium (µg/l)	7440-70-2	27,300	79,900	192,000	181,000	17,900	10,100	33,600	40,600	159,000	*NS*	*NS*	ND	ND	83,400	2,880	7,800	*NS*	102,000	*NS*
Chloride (µg/l)	16887-00-6	**264,000**	**342,000**	**1,230,000**	**1,270,000**	174,000	18,000	15,300	**411,000**	**685,000**	*250,000*	--	ND	ND	**356,000**	11,900	13,700	*250,000*	239,000	*250,000*
Fluoride (µg/l)	16984-48-8	130	130	220	220	420	520	180	260	ND	*2,000*	--	ND	ND	130	100	ND	*1,800*	340	*2,000*
pH* (standard units)	-	6.6	6.7	7.6	7.1	**6.4**	6.9	**6.4**	6.6	6.8	*6.5-8.5*	--	N/A	N/A	6.7	6.9	6.5	*6.0-9.0*	7.7	*6.5-8.5*
Sulfate (µg/l)	14808-79-8	19,600	10,500	230,000	12,900	3,900	3,100	214,000	38,000	5,700	*250,000*	--	ND	ND	10.4	3,500	5,500	*250,000*	94,500	*250,000*
Total Dissolved Solids (µg/l)	-	**628,000**	**770,000**	**2,700,000**	**2,530,000**	**513,000**	194,000	**689,000**	**982,000**	**1,130,000**	*500,000*	--	ND	ND	**754,000**	94,000	121,000	*500,000*	**516,000**	*500,000*
EPA APPENDIX IV																				
Antimony (µg/l)	7440-36-0	ND	ND	**10.6**	**8.7**	ND	ND	ND	**5.5**	**8.1**	*1*	--	ND	ND	ND	ND	ND	*5.6*	**10.7**	*1*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*	**12**	*10*
Barium (ug/l)	7440-39-3	302	129	230	578	86	91	108	208	**1220**	*700*	--	ND	ND	137	59.8	53.0	*1,000*	177	*700*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	ND	ND	*6.5*	ND	*4*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	5.7	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*50*	9	*10*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*3*	ND	*1*
Fluoride (µg/l)	16984-48-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2,000*	--	ND	ND	ND	ND	ND	*1,800*	ND	*2,000*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	--	ND	ND	ND	ND	ND	*25*	ND	*15*
Lithium (µg/l)	7439-93-2	36.8	28.4	117	217	18.3	9.7	41.2	20.7	37.6	*NS*	*NS*	ND	ND	28.3	1.5	1.1	*NS*	40	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*	ND	*1*
Molybdenum (µg/l)	7439-98-7	ND	ND	9.5	8.6	ND	ND	ND	ND	ND	*NS*	*NS*	ND	ND	ND	ND	ND	*160*	133	*NS*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*	**246**	*20*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	--	ND	ND	ND	ND	ND	*0.24*	ND	*0.28*
Radium 226 (pCi/l)	13982-63-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*	*5 (combined)*	ND	ND	ND	ND	ND	*NS*	ND	*NS*
Radium 228 (pCi/l)	15262-20-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*		ND	ND	ND	ND	ND	*NS*	ND	*NS*
EPA APPENDIX I METALS																				
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	ND	ND	*7*	ND	*1,000*
Nickel (µg/l)	7440-02-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*100*	--	ND	ND	ND	ND	ND	*88*	ND	*100*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0.06*	ND	*20*
Vanadium (µg/l)	7440-62-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.3*	--	ND	ND	ND	ND	ND	*NS*	**28**	*0.3*
Zinc (µg/l)	7440-66-6	ND	10.2	113	12.5	ND	36.1	ND	ND	47.7	*1,000*	--	ND	ND	ND	ND	14.2	*50*	ND	*1,000*
EPA APPENDIX I VOC'S																				
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*	ND	*6,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*	ND	*0.6*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*	ND	*4*
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*6*	ND	*70*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*	ND	*0.4*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*	ND	*700*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*	ND	*70*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*	ND	*6*

Notes:

1. Groundwater and surface water samples collected on April 5 through April 7, 2016 and analyzed for above parameters by Pace Analytical Laboratories
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and **shade** denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. pH was field tested by Pace Analytical Laboratories

A

Appendix A – Sampling and Field Logs

Charrah – Brickhaven

Round 4

01/04/16

Well Sweep

Well ID	Static Water Level: (ft)
BG-1	10.05
MW-5	14.70
MW-6	6.57
MW-7	15.60
MW-8	35.87
MW-1	58.05
MW-2	32.78
MW-3	11.92
MW-4	10.15

Charah – Brickhaven

Round 5

02/16/16

Well Sweep

Well ID	Static Water Level (ft)	Total Depth (ft)
BG-1	9.25	43.78
MW-1	57.32	75.55
MW-2	31.15	48.13
MW-3	10.25	43.60
MW-4	5.77	25.74
MW-5	16.17	46.96
MW-6	6.35	27.93
MW-7	16.40	17.64
MW-8	35.92	49.68

Charrah

Brickhaven

Moncure, NC

Well Sweep

04/05/2016

Well ID:	**Total Depth (ft):**	**Static Water Level (ft):**
BG-1	43.78	9.73
MW-1	75.55	58.25
MW-2	48.13	28.80
MW-3	43.60	10.20
MW-4	25.74	8.79
MW-5	46.96	24.80
MW-6	27.93	6.97
MW-7	17.64	16.05
MW-8	49.68	36.98

Notes: MW-2, MW-4, and MW-6 continue to produce high turbid samples (~ 20 ntu). MW-7 continues to not achieve the designated sample volume to satisfy all analysis.

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven - Chatham

Name and Afiliation (Sampler(s): C.S., J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-4 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: ~~22.0~~ 25.74 ft (18 01/04/16) Multi Factor*: ~~2.54117~~ .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.15 ft Casing Volume: 2.54117 gallons

Height of Water Column: 15.59 ft Cal. 3 Volumes: 7.6235 gallons

Purge Information

Date Purged: 01 / 04 / 16 Start Time: 1450 Finish: 1515 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 2500 mL ~~gallons~~

Sampling Information

Date Collected: 01/04/16 Time Collected: 1515 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x 3,
		metals x 2, 8260 x 3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 11.3 Time: 1515 Turbidity (ntu): 3.81 Time: 1515

Sample pH (s.u.): 6.38 Time: Diss Oxy (mg/L): 0.33 Time: 1515

Specific Cond. (uS): 1532 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): -28.3 Time: Other: Iron: 2.5 mg/L Time: 1515

Odor: None Time: Appearance: Clear w/ particles

General/Weather Observations

39°F Cold, wind 10 mph.

Sampler Signature/Date: [signature] / 01/04/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level (ft)
1455	6.42	1558	-38.2	2.93	0.74	11.2	500mL	10.53
1500	6.41	1563	-39.3	1.52	0.54	11.7	1000mL	10.73
1505	6.40	1558	-38.2	1.33	0.35	11.7	1500mL	10.79
1510	6.39	1552	-36.7	1.60	0.34	11.7	2000mL	Stable
1515	6.38	1532	-28.3	3.81	0.33	11.3	2500mL	Stable

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven-Channel

Name and Afiliation (Sampler(s)): C.S. S.A/ PAC

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-5 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: ~~44.0~~ 46.96 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 14.70 ft Casing Volume: 5.25838 gallons

Height of Water Column: 32.26 ft Cal. 3 Volumes: 15.77514 gallons

Purge Information

Date Purged: 01/04/16 Start Time: 1300 Finish: 1325 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 2500 mL gallons

Sampling Information

Date Collected: 01/04/16 Time Collected: 1325 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		Metals x2, Sebo x3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 11.7 Time: 1325 Turbidity (ntu): 2.32 Time: 1325

Sample pH (s.u.): 7.00 Time: Diss Oxy (mg/L): 1.01 Time: 1325

Specific Cond. (uS): 482.9 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 181.1 Time: Other: Iron 0.0 mg/L Time: 1325

Odor: None Time: Appearance: Clear

General/Weather Observations

43°F Cloudy, Cold. Outside fence near water storage (leachate) No recharge

Sampler Signature/Date: [signature] / 01/04/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1305	7.00	485.0	189.2	1.41	1.27	12.8	500 mL	15.18
1310	7.00	484.3	187.1	1.48	1.10	12.7	1000 mL	16.20
1315	7.01	486.3	184.2	2.10	1.03	11.9	1500 mL	16.70
1320	7.00	483.3	182.7	1.05	1.02	12.0	2000 mL	17.10
1325	7.00	482.9	181.1	2.32	1.01	11.7	2500 mL	17.33

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven - Charrah

Name and Afiliation (Sampler(s): C.S., J.A./ Pitt

Name and Afiliation (Inspector): —

Well Information

Well ID: Leachate-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 01/04/16 Time Collected: 1345 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 8260x3,
		TDS, Fluoride,
		Chloride / Sulfate

Field Measurements/Observations

Sample Temp (°C): 12.7 Time: 1345 Turbidity (ntu): 79.71 Time: 1345

Sample pH (s.u.): 7.66 Time: | Diss Oxy (mg/L): 5.50 Time: 1345

Specific Cond. (uS): 87.4 Time: | Res. Cl (mg/L): — Time: —

ReDox (mV): 175.3 Time: | Other: Iron Time: 1345

Odor: None Time: | Appearance: Cloudy

General/Weather Observations

Cold, 40°F, wind -5-10mph Inside concrete wall, sign JHA to enter.

Sampler Signature/Date: [signature] / 01/04/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven - Charrah

Name and Afiliation (Sampler(s): C.S., J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: BG-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: ~~41.0~~ 43.78 ft (LS 01/04/16) ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.05 ft Casing Volume: 5.4869 gallons

Height of Water Column: ~~43.78~~ 33.63 ft (LS 01/04/16) Cal. 3 Volumes: 16.44507 gallons

Purge Information

Date Purged: 01 / 04 / 16 Start Time: 1127 Finish: 1152 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 2500 ~~gallons~~ mL

Sampling Information

Date Collected: 01/04/16 Time Collected: 1152 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 8260x3,
		TDS, Fluoride,
		Chloride / sulfate

Field Measurements/Observations

Sample Temp (°C): 10.5 Time: 1152 Turbidity (ntu): 1.17 Time: 1152

Sample pH (s.u.): 6.51 Time: Diss Oxy (mg/L): 2.89 Time: 1152

Specific Cond. (uS): 1201 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 247.8 Time: Other: Iron: 0.0 mg/L Time: 1152

Odor: None Time: Appearance: Clear

General/Weather Observations

40°F Near Front gate, A lot of traffic. No recharge. Cloudy. Cold

Sampler Signature/Date: [signature] / 01/04/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1132	6.41	1198	216.7	2.38	3.10	10.8	500 mL	10.58
1137	6.48	1203	223.2	~~2.45~~	2.93	10.0	1000 mL	10.75
1142	6.50	1208	232.9	1.42	~~2.8~~ 2.90	10.4	1500 mL	10.85
1147	6.50	1193	243.8	1.27	2.91	10.2	2000 mL	10.90
1152	6.51	1201	247.4	1.17	2.89	10.5	2500 mL	Stable

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Field Data Sheet

Client: IAR Location: Moncure, NC Project Name/#: Brickhaven - Charrah

Name and Afiliation (Sampler(s): CS, JA

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 01/04/16 Time Collected: 0935 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		Metals x2, 8260x3,
		Fluoride TDS
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 5.7 Time: 0935 Turbidity (ntu): 171.4 Time: 0935

Sample pH (s.u.): 6.17 Time: Diss Oxy (mg/L): 8.25 Time: 0935

Specific Cond. (uS): 94.9 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 140.5 Time: Other: Iron 0.0mg/L Time: 0935

Odor: None Time: Appearance: Muddy orange

General/Weather Observations

Area (creek) more inundated by water. 39°F

Sampler Signature/Date: [signature] 01/04/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickshaven - church

Name and Afiliation (Sampler(s)): C.S. J.A/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: GW-2 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: 01 / 04 / 16 Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 01/04/16 Time Collected: 0855 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3
		metals x2, 8260x3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 6.4 Time: 0855 Turbidity (ntu): 23.33 Time: 0855

Sample pH (s.u.): 6.15 Time: _____ Diss Oxy (mg/L): 1.88 Time: 0855

Specific Cond. (uS): 124.0 Time: _____ Res. Cl (mg/L): — Time: —

ReDox (mV): 59.1 Time: _____ Other: Iron: 0.0 mg/L Time: 0855

Odor: None Time: _____ Appearance: light brown tint

General/Weather Observations

Flooded area, water mark waist high on trees, film on water, 34°F

Sampler Signature/Date: [signature] / 01/04/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
				23.33				

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charan - Brickhaven

Name and Afiliation (Sampler(s): C.S, J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-3 Well Locked: YES NO - Broken lock (#2 lock)

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: ~~40~~ 43.60 ft ft 01/05/16 Multi Factor*: 51630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 11.92 ft Casing Volume: 5.16384 gallons

Height of Water Column: 31.68 ft Cal. 3 Volumes: 15.49152 gallons

Purge Information

Date Purged: 01/05/16 Start Time: 1415 Finish: 1440 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 2500 mL ~~gallons~~

Sampling Information

Date Collected: 01/05/16 Time Collected: 1440 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		metals x2, 8260x3,
		Fluoride, TDS
		Chloride/sulfate

Field Measurements/Observations

Sample Temp (°C): 12.4 Time: 1440 Turbidity (ntu): 5.69 Time: 1440

Sample pH (s.u.): 7.3 Time: Diss Oxy (mg/L): 2.07 Time: 1440

Specific Cond. (uS): 4248 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 136.0 Time: Other: Iron. Time: 1440

Odor: None Time: Appearance: Clear

General/Weather Observations

Sunny, calm, wind: 2-3 mph, 40°F, No recharge

Sampler Signature/Date: [signature] / 01/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level (ft)
1420	7.31	4261	143.4	4.96	1.90	13.1	500 mL	12.30
1425	7.34	4244	141.7	5.61	2.08	11.7	1000 mL	14.19
1430	7.34	4231	139.7	5.18	2.06	12.7	1500 mL	14.50
1435	7.34	4278	137.1	6.15	2.08	12.4	2000 mL	15.12
1440	7.33	4248	136.0	5.69	2.07	12.4	2500 mL	~~15.90~~ 01/05/16 15.53

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: ~~Cherah~~ Brickshaven

Name and Afiliation (Sampler(s): CS, J, A / Pace Cherah CS 01/05/16

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-6 Well Locked: YES NO - Broken Lock

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 27.93 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 6.57 ft Casing Volume: 3.48168 gallons

Height of Water Column: 21.36 ft Cal. 3 Volumes: 10.44504 gallons

Purge Information

Date Purged: 01 / 05 / 16 Start Time: 1015 Finish: 1040 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 2500 ~~gallons~~ mL

Sampling Information

Date Collected: 01/05/16 Time Collected: 1040 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		metals x2, 8260x3,
		TDS, Fluoride
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 10.7 Time: 1040 Turbidity (ntu): 3.63 Time: 1040

Sample pH (s.u.): 6.67 Time: Diss Oxy (mg/L): 0.64 Time: 1040

Specific Cond. (uS): 1530 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 138.3 Time: Other: Iron: 0.0 mg/L Time: 1040

Odor: None Time: Appearance: Clear

General/Weather Observations

Cold 35°F. wind 10 mph, well down gradient

Sampler Signature/Date: [signature] / 01/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level (ft)
1020	6.50	1540	147.7	1.21	0.88	11.2	500 mL	7.32
1025	6.63	1546	144.9	3.24	0.73	11.1	1000 mL	7.41
1030	6.66	1543	143.8	3.27	0.66	11.8	1500 mL	7.48
1035	6.66	1540	142.7	3.67	0.65	10.8	2000 mL	Stable
1040	6.67	1530	138.3	3.63	0.64	10.7	2500 mL	Stable

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: ~~Cherokee~~ - Bi-Weekly
Name and Afiliation (Sampler(s)): C.S. / J.A / PACE Cherokee 01/05/16
Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: YES NO
Well Diameter: 2" Construction: PVC Steel Stainless Steel
Total Well Depth: ~~15.0~~ 17.64 ft ft 01/05/16 Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]
Static Water Level: ~~15.60~~ ~~15.60~~ ft 15.60 ft 01/05/16 Casing Volume: 0.33252 gallons
Height of Water Column: 2.04 ft 01/05/16 Cal. 3 Volumes: 0.99756 gallons

Purge Information

Date Purged: 01 / 05 / 16 Start Time: 1155 Finish: 1220 Purge Rate: 100 mL/min
Purging Method: Peristaltic Total Volume Purged: 2500 ~~gallons~~ mL

Sampling Information

Date Collected: 01/05/16 Time Collected: 1220 am pm
Sampling Equipment Used: Gravity

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 9056 x3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 9.7 Time: 1220 Turbidity (ntu): 1.26 Time: 1220
Sample pH (s.u.): 6.87 Time: Diss Oxy (mg/L): 2.89 Time: 1220
Specific Cond. (uS): 1962 Time: Res. Cl (mg/L): — Time: —
ReDox (mV): 126.4 Time: Other: Iron: 0.0 mg/L Time: 1220
Odor: None Time: Appearance: Clear

General/Weather Observations

Cold, 36°F. Near retainment wall, construction below. No recharge little H_2O dry at end of ~~sampling~~ sampling

Sampler Signature/Date: [signature] / 01/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level (ft)
1200	6.88	1934	109.7	3.59	3.20	9.7	500 mL	15.95
1205	6.88	1931	119.6	1.96	3.18	9.5	1000 mL	15.98
1210	6.88	1939	119.7	1.30	2.98	9.6	1500 mL	16.01
1215	6.87	1938	124.1	1.25	2.89	9.7	2000 mL	16.06
1220	6.87	1962	126.4	1.26	2.89	9.7	2500 mL	16.10

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Chemours - Brickhaven

Name and Afiliation (Sampler(s)): CS, JA/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-1 Well Locked: YES NO - Broken lock

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: ~~72.0~~ 75.55 ft 01/06/16 Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 58.05 ft Casing Volume: 2.8525 gallons

Height of Water Column: 17.50 ft Cal. 3 Volumes: 8.5575 gallons

Purge Information

Date Purged: 01 / 06 / 16 Start Time: 1140 Finish: 1340 Purge Rate: 100 mL/min.

Purging Method: Monsoon Total Volume Purged: 12000 ~~gallons~~ mL

Sampling Information

Date Collected: 01/06/16 Time Collected: 1340 am pm

Sampling Equipment Used: Gear

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 8260 x3,
		Fluoride, TDS,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 15.9 Time: 1340 Turbidity (ntu): 10.00 Time: 1340

Sample pH (s.u.): 6.71 Time: Diss Oxy (mg/L): 0.19 Time:

Specific Cond. (uS): 1794 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 103 Time: Other: Iron: 0.0 mg/L Time: 1340

Odor: None Time: Appearance: Cloudy → Clear

General/Weather Observations

Cold. 37°F. Wind: 2-5mph. Good recharge. Top of hill overlooking Ash cell.

Sampler Signature/Date: [signature] / 01/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1145	7.29	740	-36.3	331.7	1.60	14.1	500mL	58.20
1150	7.20	760	-48.4	512.7	1.66	14.5	1000mL	58.22
1200	7.19	664	-45.9	493.6	1.21	14.5	2000mL	Stable
1210	7.19	620	-43.9	335.3	0.77	16.1	3000mL	
1220	7.15	630	-38.4	248.7	0.44	16.0	4000mL	

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Client: HDR

Location: Monroe, NC

Project: Church - Brickhaven

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1230	7.11	686	-36.8	128.1	0.30	16.0	500mL	58.25
1240	7.00	907	-28.2	73.96	0.22	15.9	600mL	Stable
1250	6.87	1214	-13.5	37.92	0.19	15.7	700mL	
1300	6.74	1551	2.4	30.73	0.17	15.9	800mL	
1310	6.72	1641	7.1	26.87	0.17	15.8	900mL	
1320	6.70	1717	10.0	15.02	0.19	16.4	1000mL	
1330	6.71	1774	10.7	12.12	0.19	16.2	11,000mL	
1340	6.71	1794	10.3	10.00	0.19	15.9	12,000mL	2 hr mark

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Chevron - Brickhaven

Name and Afiliation (Sampler(s)): C.S., J.A / CAE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-2 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: ~~45.0~~ 48.13 ft 01/05/16 Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 32.78 ft Casing Volume: 2.50205 gallons

Height of Water Column: 15.35 ft Cal. 3 Volumes: 7.50615 gallons

Purge Information

Date Purged: 01 / 06 / 16 Start Time: 1500 Finish: 1720 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 14000 ~~gallons~~ mL

Sampling Information

Date Collected: 01/06/16 Time Collected: 1720 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3
		Metals x2, 8260 x3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 8.7 Time: 1720 Turbidity (ntu): 9.95 Time: 1720

Sample pH (s.u.): 7.95 Time: Diss Oxy (mg/L): 4.06 Time: 1720

Specific Cond. (uS): 4683 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 24.1 Time: Other: Iron: 0.0 mg/L Time: 1720

Odor: None Time: Appearance: ~~Clear~~ Cloudy → Clear 01/06/16

General/Weather Observations

Cool 43°F. Flooded around well. No recharge

Sampler Signature/Date: [signature] / 01/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level (ft)
1505	7.63	4590	23.4	60.24	3.60	13.1	500mL	33.80
1515	7.72	4590	45.2	79.46	3.65	11.3	1500mL	35.08
1525	7.73	4592	45.6	102.7	3.67	11.1	2500mL	36.30
1535	7.76	4597	49.9	97.59	3.75	11.4	3500mL	36.40
1545	7.92	4614	46.2	83.59	3.80	10.4	4500mL	36.50

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Client: HDR

Location: Monroe, NC

Project: Charah - Buckhaven

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level: (A)
1555	7.86	4639	41.8	59.50	3.88	10.5	5500mL	36.58
1605	7.89	4663	38.3	47.18	3.76	9.5	6500mL	36.70
1615	7.90	4644	33.7	41.81	3.74	9.4	7500mL	37.12
1625	7.90	4643	31.6	35.64	4.08	10.3	8500mL	37.40
1635	7.93	4666	28.9	32.21	3.93	10.0	9500mL	37.80
1645	7.94	4675	25.8	24.63	3.84	9.4	10,500mL	
1655	7.94	4673	25.0	19.78	3.99	8.9	11,500mL	
1705	7.94	4683	24.7	17.01	3.95	8.7	12,500	2 hr mark
1710	7.96	4671	24.0	11.73	4.10	8.6	13000mL	38.75
1715	7.95	4680	24.1	10.01	4.09	8.7	13500mL	39.00
1720	7.95	4683	24.1	9.95	4.08	8.7	14000mL	39.30

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven ~~Charah~~ Charah CS 01/05/16

Name and Afiliation (Sampler(s): C.S., J.A / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-8 Well Locked: YES NO

Well Diameter: 2 Construction: PVC Steel Stainless Steel

Total Well Depth: ~~46.0~~ 49.68 ft 01/05/16 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 35.87 ft Casing Volume: 2.25103 gallons

Height of Water Column: 13.81 ft Cal. 3 Volumes: 6.75309 gallons

Purge Information

Date Purged: 01/06/16 Start Time: 0835 Finish: 1050 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 13,500 ~~gallons~~ mL

Sampling Information

Date Collected: 01/06/16 Time Collected: 1050 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		Metals x2, 8260x3,
		~~TDS~~ Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 13.9 Time: 1050 Turbidity (ntu): 7.69 Time: 1050

Sample pH (s.u.): 6.81 Time: 1050 Diss Oxy (mg/L): 1.15 Time: 1050

Specific Cond. (uS): 3066 Time: 1050 Res. Cl (mg/L): — Time: —

ReDox (mV): 85.0 Time: 1050 Other: Iron: 0.0 mg/L Time: 1050

Odor: None Time: 1050 Appearance: Cloudy (Start) → Clear (Finish)

General/Weather Observations

Cold. 34°F. Down gradient. wind: 2-5 mph.

Sampler Signature/Date: [signature] / 01/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level: (ft)
0840	6.45	4638	176.0	127.8	2.99	12.0	500 mL	36.90
0850	6.64	4616	145.8	71.92	2.89	10.3	1500 mL	37.00
0900	6.68	4442	133.4	55.75	2.60	11.2	2500 mL	Stable
0910	6.70	4284	125.8	48.79	2.44	10.4	3500 mL	
0920	6.72	4142	121.5	42.94	2.16	11.1	4500 mL	

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Client: HDR

Location: Monroe, NC

Project: Church - Brashaven

Well ID: MW-8

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
0930	6.72	3967	118.9	26.46	2.16	11.7	3500 ml	37.00
0940	6.74	3906	116.9	23.48	2.01	11.2	6500 ml	Stable
0950	6.75	3787	117.1	22.97	1.89	10.3	7500 ml	Stable
1000	6.74	3635	113.2	23.03	1.65	13.8	8500 ml	
1010	6.75	3554	107.4	18.33	1.58	13.9	9500 ml	
1020	6.78	3314	99.0	13.34	1.32	14.0	10500 ml	
1030	6.79	3195	94.5	12.49	1.22	14.0	11500 ml	
1040	6.80	3108	89.5	11.01	1.15	14.2	12500 ml	2 hr overK
1045	6.81	3086	86.5	9.52	1.16	13.9	13000 ml	Stable
1050	6.81	3066	85.0	7.69	1.19	13.9	13500 ml	

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cherah - Brickhaven

Name and Afiliation (Sampler(s): C.S / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ft Casing Volume: _____ gallons

Height of Water Column: _____ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 02/16/16 Time Collected: 1650 am pm

Sampling Equipment Used: _____

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		metals x2, 8260 x3,
		TDS Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 12.9 Time: 1650 Turbidity (ntu): 1000+ Time: 1650

Sample pH (s.u.): 7.58 Time: | Diss Oxy (mg/L): 8.34 Time: 1650

Specific Cond. (uS): 82.7 Time: | Res. Cl (mg/L): — Time: —

ReDox (mV): 191.2 Time: | Other: Iron: ND Time: 1650

Odor: None Time: | Appearance: muddy, storm-water

General/Weather Observations

Flooded, muddy stream. Cloudy, 55°F, wind 2-3 mph

Sampler Signature/Date: [signature] 02/16/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
1650	7.58	82.7	191.2	1000+	8.34	12.9		

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charah - Brickhaven Round 5

Name and Afiliation (Sampler(s): C.S / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-3 Well Locked: YES NO - Broken lock

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.60 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.25 ft Casing Volume: ~~41.92~~ 5.43 gallons 02/16/16

Height of Water Column: 33.35 ft Cal. 3 Volumes: 16.30 gallons

Purge Information

Date Purged: 02 / 16 / 16 Start Time: 1220 Finish: 1245 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 0.66 gallons

Sampling Information

Date Collected: 02/16/16 Time Collected: 1245 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		metals x2, 8260 x3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 15.9 Time: 1245 Turbidity (ntu): 0.84 Time: 1245

Sample pH (s.u.): 7.22 Time: Diss Oxy (mg/L): 0.58 Time: 1245

Specific Cond. (uS): 4442 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 290.8 Time: Other: Iron: 0.0mg/L Time: 1245

Odor: None Time: Appearance: Clear

General/Weather Observations

Partly Cloudy/Sunny, 54°F wind: 5 mph, No recharge

Sampler Signature/Date: [signature] 02/16/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1225	7.20	4436	293.4	1.87	0.57	15.8	500mL	11.50
1230	7.22	4440	293.1	1.86	0.56	15.9	1000mL	12.50
1235	7.19	4436	291.9	1.79	0.57	15.9	1500mL	13.55
1240	7.21	4439	291.3	1.27	0.58	15.9	2000mL	14.59
1245	7.22	4442	290.8	0.84	0.58	15.9	2500mL	15.5

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charah-Brickhaven Round 5

Name and Afiliation (Sampler(s): C.S / PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-4 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 25.74 ft Multi Factor*: 0.630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 5.77 ft Casing Volume: 3.25 gallons

Height of Water Column: 19.97 ft Cal. 3 Volumes: 9.76 gallons

Purge Information

Date Purged: 02 / 16 / 16 Start Time: 1335 Finish: 1635 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 4.75 gallons

Sampling Information

Date Collected: 02/16/16 Time Collected: 1635 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3, metals x2, VOC x3, TDS, Fluoride, Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 16.3 Time: 1635 Turbidity (ntu): 9.92 Time: 1635

Sample pH (s.u.): 6.33 Time: Diss Oxy (mg/L): 0.12 Time: 1635

Specific Cond. (uS): 1331 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 34.6 Time: Other: Iron: 1.0 mg/L Time: 1635

Odor: None Time: Appearance: Clear w/ Floc (orange)

General/Weather Observations

Sunny 55°F wind 5-10 mph 3 hr mark Good recharge

Sampler Signature/Date: [signature] / 02/16/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water level CA
1340	6.47	1413	23.0	22.24	0.17	16.2	500 mL	10.00
1345	6.45	1412	30.6	15.40	0.17	15.5	1000 mL	
1355	6.37	1362	21.4	32.10	0.11	16.3	2000 mL	Orangle particles
1405	6.35	1325	37.0	32.33	0.29	16.3	3000 mL	10.50
1415	6.35	1326	37.8	26.29	0.20	16.2	4000 mL	Stable

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Client: HDR

Location: Monroe, NC

Project: Charah - Brickhaven Round 5

Well ID: MW-4

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4630
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1425	6.33	1327	36.6	25.91	0.11	16.1	500ml	Stable (10.50)
1435	6.33	1330	36.1	23.52	0.11	16.2	600ml	
1440	6.33	1331	34.6	18.63	0.12	16.3	650ml	
1450	STABLE	—	—	15.62	STABLE	—	~~750ml~~	
1500	STABLE	—	—	14.12	STABLE	—	850ml	—
1510				11.26			950ml	
1520				10.87			1050ml	
1530				10.45			1150ml	
1540				14.27			1250ml	
1550				13.41			1350ml	
1600				13.11			1450ml	
1610				12.47			1550ml	
1620				11.92			1650ml	
1630				10.12			1750ml	
1635				8.95			1800ml	
3½ mark				9.92				

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cherah - Brickhaven Round 5

Name and Afiliation (Sampler(s): CS / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-5 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 46.96 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 16.17 ft Casing Volume: 5.01 gallons

Height of Water Column: 30.79 ft Cal. 3 Volumes: 15.05 gallons

Purge Information

Date Purged: 02/16/16 Start Time: 1035 Finish: 1100 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 0.52 gallons

Sampling Information

Date Collected: 02/16/16 Time Collected: 1100 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x2, metals x2, TDS, Fluoride, chloride/sulfate, 8260x3

Field Measurements/Observations

Sample Temp (°C): 14.6 Time: 1100 Turbidity (ntu): 0.97 Time: 1100

Sample pH (s.u.): 7.09 Time: Diss Oxy (mg/L): 0.74 Time: 1100

Specific Cond. (uS): ~~14~~ 488.3 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 293.3 Time: Other: Iron: 0.0 mg/L Time: 1100

Odor: None Time: Appearance: Clear

General/Weather Observations

Wind: 5-10 mph, partly cloudy/sunny 54°F, No recharge

Sampler Signature/Date: [signature] / 02/16/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (ml)	Other Water Level (ft)
1040	7.07	487.9	296.0	0.70	0.72	14.3	500	17.90
1045	7.06	487.9	294.8	0.85	0.73	14.3	1000	18.50
1050	7.07	487.7	294.3	0.96	0.74	14.4	1500	19.75
1100	7.09	488.3	293.3	0.97	0.74	14.6	2000 ml	21.50

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Chowan - Brickhaven Round 5

Name and Afiliation (Sampler(s)): GS / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: B6-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.78 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 9.25 ft Casing Volume: 5.62 gallons

Height of Water Column: 34.53 ft Cal. 3 Volumes: 16.88 gallons

Purge Information

Date Purged: 02/16/16 Start Time: 0920 Finish: 0945 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 0.66 gallons

Sampling Information

Date Collected: 02/16/16 Time Collected: 0945 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		metals x2, 8260x3,
		Fluoride, TDS
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 14.5 Time: 0945 Turbidity (ntu): 0.58 Time: 0945

Sample pH (s.u.): 6.52 Time: Diss Oxy (mg/L): 1.47 Time: 0945

Specific Cond. (uS): 1161 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 383.0 Time: Other: Iron: 0.0 mg/L Time: 0945

Odor: None Time: Appearance: Clear

General/Weather Observations

Rain. Fog. 58°F. Near gate. overcast

Sampler Signature/Date: [signature] / 02/16/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other (water level) (ft)
0925	6.56	1175	370.6	0.72	1.74	14.5	500mL	10.13
0930	6.55	1166	375.9	0.77	1.63	14.4	1000mL	10.21
0935	6.54	1165	377.9	0.77	1.49	14.5	1500mL	Stable
0940	6.53	1161	381.9	0.59	1.47	14.5	2000mL	
0945	6.52	1161	383.0	0.58	1.47	14.5	2500mL	

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Chugh - Brickhaven Round 5

Name and Afiliation (Sampler(s): CS/CAC

Name and Afiliation (Inspector): —

Well Information

Well ID: Leachate - 1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ft Casing Volume: _____ gallons

Height of Water Column: _____ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 02/16/16 Time Collected: 1050 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3,
		metals x2, VOC 8260x3,
		Fluoride, Chloride/
		Sulfate, TDS

Field Measurements/Observations

Sample Temp (°C): 8.5 Time: 1050 Turbidity (ntu): 29.33 Time: 1050

Sample pH (s.u.): 7.25 Time: / Diss Oxy (mg/L): 8.73 Time: 1050

Specific Cond. (uS): 483.2 Time: / Res. Cl (mg/L): — Time: —

ReDox (mV): 268.0 Time: / Other: Iron: 0.0mg/L Time: 1050

Odor: None Time: / Appearance: Clear → muddy

General/Weather Observations

Partly Cloudy/Sunny, 54°F. Wind: 5-10mph. Clear → muddy at end of sample.

Sampler Signature/Date: [signature] / 02/16/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charah - Brickshaven (Round 5)

Name and Afiliation (Sampler(s): C.S / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-1 Well Locked: YES NO - Broken Lock

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 75.55 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 57.32 ft Casing Volume: 2.97 gallons

Height of Water Column: 14.23 ft Cal. 3 Volumes: 8.91 gallons

Purge Information

Date Purged: 02/17/16 Start Time: 1230 Finish: 1345 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 2.0 gallons

Sampling Information

Date Collected: 02/17/16 Time Collected: 1345 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		metals x2, 8260 x3,
		TDS Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 17.4 Time: 1345 Turbidity (ntu): 8.91 Time: 1345

Sample pH (s.u.): 6.84 Time: | Diss Oxy (mg/L): 0.13 Time: 1345

Specific Cond. (uS): 932 Time: | Res. Cl (mg/L): — Time: —

ReDox (mV): 25.1 Time: | Other: Iron: 0.0 mg/L Time: 1345

Odor: None Time: — Appearance: Dirty → Duplicate

General/Weather Observations

Sunny. 52°F. Wind: 2-5 mph. MW-1 Dup: 1400

Sampler Signature/Date: [signature] / 02/17/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1235	7.29	578.1	-18.8	106.1	0.22	17.0	500mL	58.30
1245	7.09	630	-4.2	85.55	0.09	17.2	1500mL	Stable
1255	6.96	765	6.1	54.79	0.08	17.3	2500mL	
1305	6.94	~~7.89~~ 789	8.4	31.69	0.08	17.3	3500mL	
1315	6.88	865	17.4	26.61	0.07	17.4	4500mL	

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Client: HDR

Location: Monroe, NC

Project: Church - Birchtown (Round 5)

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1325	6.86	905	22.3	17.49	0.06	17.4	5500ml	58.30
1335	6.84	928	25.5	10.48	0.05	17.4	6500ml	stable
1340	6.84	930	25.1	9.60	0.13	17.4	7000ml	
1345	6.84	932	25.1	8.91	0.13	17.4	7500ml	

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven / Church (Round 5)

Name and Afiliation (Sampler(s)): C.S / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-2 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 48.13 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ~~32.78~~ 31.15 ft Casing Volume: 2.76 gallons

Height of Water Column: 16.98 ft Cal. 3 Volumes: 8.30 gallons

Purge Information

Date Purged: 02 / 17 / 16 Start Time: 0915 Finish: 1110 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 3.0 gallons

Sampling Information

Date Collected: 02/17/16 Time Collected: 1110 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 8260 x3
		TDS, Fluoride,
		Chloride / Sulfate
		(1/2 samples = Cloudy)

Field Measurements/Observations

Sample Temp (°C): 16.1 Time: 1110 Turbidity (ntu): 9.76 Time: 1110

Sample pH (s.u.): 7.63 Time: Diss Oxy (mg/L): 4.18 Time: 1110

Specific Cond. (uS): 4616 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 143.2 Time: Other: Iron 0.0 mg/L Time: 1110

Odor: None Time: Appearance: Cloudy → Clear → Cloudy

General/Weather Observations • Went Dry at end of sample • Recharge = dirty

Overcast, Cloudy, Cool. 44°F. Wind 2-5mph. No recharge

Sampler Signature/Date: Chris Powell / 02/17/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water level (ft)
0920	7.18	4620	123.4	139.6	3.74	14.1	500mL	33
0930	7.36	4648	126.1	232.9	3.62	15.3	1500mL	
0940	7.49	4605	138.4	100.2	3.96	13.2	2500mL	
0950	7.54	4608	141.1	72.03	4.10	13.6	3500mL	35
1000	7.57	4622	142.9	60.43	4.05	13.9	4500mL	

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Client: HDR

Location: Monroe, NC

Project: Charah - Brickhaven (Fund 5)

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1010	7.59	4648	144.5	54.19	4.03	16.5	5500 mL	36.80
1020	7.63	4657	146.0	31.28	4.28	13.9	6500 mL	
1030	7.63	4660	147.8	22.66	4.16	13.2	7500 mL	
1040	7.64	4654	147.0	16.72	4.39	13.1	8500 mL	37.80
1050	7.63	4674	146.8	15.32	3.97	13.5	9500 mL	
1100	7.63	4620	144.4	12.79	4.20	15.4	10500 mL	38.40
1105	7.63	4596	143.6	9.45	4.18	15.8	11000 mL	
1110	7.63	4616	143.2	9.76	4.18	16.1	11500 mL	38.50
								SAMPLE = DIRTY
								Recharge = DIRTY

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Church-Brickhaven (Round 5)

Name and Afiliation (Sampler(s)): GS/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-6 Well Locked: YES NO - Broken Lock

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 27.93 ft Multi Factor*: .1636 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 6.35 ft Casing Volume: 3.51 gallons

Height of Water Column: 21.58 ft Cal. 3 Volumes: 10.55 gallons

Purge Information

Date Purged: 02 / 17 / 16 Start Time: 1450 Finish: ~~1655~~ 1755 GS 02/17/16 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 02/17/16 Time Collected: 1655 am pm

Sampling Equipment Used: GSMB

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 8260 x3,
		Fluoride, TDS
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 15.1 Time: 1755 Turbidity (ntu): 25.12 Time: 1755

Sample pH (s.u.): 6.35 Time: — Diss Oxy (mg/L): 0.16 Time: 1755

Specific Cond. (uS): 1307 Time: — Res. Cl (mg/L): — Time: —

ReDox (mV): 172.4 Time: — Other: Iron: 0.0 mg/L Time: —

Odor: None Time: — Appearance: Cloudy w/ White Flakes

General/Weather Observations

Sunny 55°F, wind 2-5 mph 3 hr well, Turbidity much higher than 1st round.

Sampler Signature/Date: [signature] 02/17/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1455	7.02	1640	162.9	7.68	0.98	14.7	500 ml	7.20
1500	6.82	1639	163.0	8.58	0.89	14.6	1000 ml	7.80
1505	6.77	1640	163.0	6.75	0.77	14.7	1500 ml	Stable
1510	6.76	1641	163.1	69.68	0.76	14.6	2000 ml	
1515	6.75	1641	163.1	87.58	0.75	14.6	2500 ml	

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Client: HDR

Location: Moncure, NC

Project: Cherokee - Brickhaven (Round 5)

Well ID: MW-6

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0913
1.625	0.1020
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1525	6.60	1551	160.7	82.37	0.49	15.0	3500mL	7.80
1535	6.52	1492	153.3	54.70	0.39	15.0	4500mL	Stable
1545	6.44	1421	140.5	51.82	0.28	15.2	5500mL	
1555	6.42	1367	126.9	31.25	0.27	15.0	6500mL	
1605	6.37	1341	118.3	31.20	0.20	15.1	7500	
1615	6.37	1341	118.0	30.59	0.21	15.1	8500	
1625	6.35	1311	112.5	28.80	0.19	15.1	9500mL	
1635	6.35	1307	112.4	26.69	0.18	15.1	10500mL	
1645	STABLE	—			STABLE	—	11500mL	
1655	STABLE	—			STABLE		12500mL	
1705							13500mL	
1715							14500mL	
1725							15500mL	
1735							16500mL	
1745							17500mL	
1755				25.12			18500mL	
3hr mark							~~19500mL~~	
							CS	

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Chatah - Brickhaven (Round 5)

Name and Afiliation (Sampler(s): C.S / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-2 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ft Casing Volume: _____ gallons

Height of Water Column: _____ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ____/____/____ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: ~~6~~ 02/17/16 Time Collected: 0815 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228x3
		metals x2, Fluoride
		Chloride/Sulfate,
		TDS, 8260x3

Field Measurements/Observations

Sample Temp (°C): 7.8 Time: 0815 Turbidity (ntu): 75.86 Time: 0815

Sample pH (s.u.): 6.36 Time: Diss Oxy (mg/L): 7.70 Time: 0815

Specific Cond. (uS): 90.6 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 182.0 Time: Other: Iron: 0.0 mg/L Time: 0815

Odor: None Time: Appearance: Cloudy

General/Weather Observations

Cloudy, Cool, Area Flooded, 43°F.

Sampler Signature/Date: [signature] / 02/17/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cherah - Brickhaven (Round 5)

Name and Afiliation (Sampler(s): C.S / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 17.64 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 16.40 ft Casing Volume: 0.20 gallons

Height of Water Column: 1.24 ft Cal. 3 Volumes: 0.60 gallons

Purge Information

Date Purged: 02/18/16 Start Time: 0820 Finish: 0845 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 0.66 gallons

Sampling Information

Date Collected: 02/18/16 Time Collected: 0845 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		X Radium 226/228x3, - could not sample
		✓ metals x2 ✓ 8260x3, (well DRY)
		✓ TDS ✓ Fluoride
		✓ Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 9.4 Time: 0845 Turbidity (ntu): 4.96 Time: 0845

Sample pH (s.u.): 6.87 Time: Diss Oxy (mg/L): 5.09 Time: 0845

Specific Cond. (uS): 1977 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 154.6 Time: Other: Iron, 0.0 mg/L Time: 0845

Odor: None Time: Appearance: Clear

General/Weather Observations

Sunny, 33°F, New retainment water. Little/No water. Dry, 2hr = No recharge. 1/2 sample

Sampler Signature/Date: [signature] / 02/18/17

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
0825	6.91	1994	153.9	5.09	5.18	10.3	500mL	16.50
0830	6.90	1996	154.1	5.50	5.17	9.9	100mL	
0835	6.89	1986	154.3	5.46	5.10	9.7	1500mL	16.60
0840	6.87	1978	154.5	5.10	5.08	9.5	2000mL	
0845	6.87	1977	154.6	4.96	5.09	9.4	2500mL	16.70

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Church - Bricklayer

Name and Afiliation (Sampler(s): C.S / PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 17.64 ft Multi Factor*: .0630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 17.60 ft Casing Volume: .00652 gallons

Height of Water Column: .04 ft Cal. 3 Volumes: 0.01956 gallons

Purge Information

Date Purged:____/____/____ Start Time:____ Finish:____ Purge Rate:____

Purging Method:____ Total Volume Purged: ____ gallons

Sampling Information

Date Collected:____ Time Collected:____ am pm

Sampling Equipment Used:____

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): ____ Time:____ Turbidity (ntu): ____ Time: ____

Sample pH (s.u.): ____ Time: ____ Diss Oxy (mg/L):____ Time: ____

Specific Cond. (uS): ____ Time: ____ Res. Cl (mg/L): ____ Time:____

ReDox (mV): ____ Time: ____ Other: ____ Time: ____

Odor: ____ Time: ____ Appearance: ____

General/Weather Observations

Well DRY 02/18/16, 02/19/16 = CHECK = DRY!

Sampler Signature/Date: [signature] 02/19/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Chorah - Brickhaven (Round 5)

Name and Afiliation (Sampler(s): C.S / PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-8 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 49.68 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 35.92 ft Casing Volume: 2.24 gallons

Height of Water Column: 13.76 ft Cal. 3 Volumes: 6.72 gallons

Purge Information

Date Purged: 02/18/16 Start Time: 1000 Finish: 1110 Purge Rate: 100mL/min

Purging Method: Monsoon Total Volume Purged: 1.85 gallons

Sampling Information

Date Collected: 02/18/16 Time Collected: 1110 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 226/228 x3,
		Metals x2, 8260 x3,
		TDS, Fluoride,
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 14.9 Time: 1110 Turbidity (ntu): 8.52 Time: 1110

Sample pH (s.u.): 6.82 Time: Diss Oxy (mg/L): 0.79 Time: 1110

Specific Cond. (uS): 2320 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 99.9 Time: Other: Iron: 0.0 mg/L Time: 1110

Odor: None Time: Appearance: Clear

General/Weather Observations

Sunny, 36°F, walk, Down gradient, muddy!

Sampler Signature/Date: [signature] /02/18/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other (FA) Water Level
1005	6.63	4425	140.1	116.3	3.01	14.9	500mL	36.30
1015	6.69	3531	126.8	61.79	1.94	15.1	1500mL	37.10
1025	6.71	3307	161.0	31.66	1.76	15.1	2500mL	
1035	6.76	2807	126.3	25.79	1.33	15.5	3500mL	37.80
1045	6.85	2367	107.2	19.60	1.09	15.0	4500mL	STABLE

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Client: HDR

Location: Montvale, NJ

Project: Church - Brickshaven (Round 5)

Well ID: MW-9

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								water level (ft)
1055	6.81	2420	103.4	11.66	0.90	14.8	550ml	37.80
1100	6.82	2373	101.9	9.76	0.81	14.7	600ml	STABLE
1105	6.82	2350	101.1	8.86	0.80	14.8	650ml	
1110	6.82	2320	99.9	8.52	0.79	14.9	700ml	

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Field Data Sheet

Client: Cuzah Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-5 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 46.96 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 24.80 ft Casing Volume: 3.61 gallons

Height of Water Column: 22.16 ft Cal. 3 Volumes: 10.83 gallons

Purge Information

Date Purged: 04 / 05 / 16 Start Time: 1200 Finish: 1220 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 2000 ~~gallons~~ mL

Sampling Information

Date Collected: 04/05/16 Time Collected: 1220 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RAD x3, metals x2,
		8260 x3, TDS,
		Fluoride, Chloride/
		Sulfate

Field Measurements/Observations

Sample Temp (°C): 11.4 Time: 1220 Turbidity (ntu): 1.4 Time: 1220

Sample pH (s.u.): 6.9 Time: Diss Oxy (mg/L): 1.3 Time: 1220

Specific Cond. (uS): 374.3 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 127.0 Time: Other: Iron: 0.0 mg/L Time: 1220

Odor: None Time: Appearance: Clear

General/Weather Observations

Wind: 15-20 mph Cloudy, 50°F.

Sampler Signature/Date: [signature] / 04/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1205	7.0	380.3	126.6	1.7	1.3	13.5	500mL	25.60
1210	6.9	373.3	126.8	1.6	1.3	12.1	1000mL	25.85
1215	6.9	374.2	127.1	1.8	1.3	12.2	1500mL	25.95
1220	6.9	374.3	127.0	1.4	1.3	11.4	2000mL	26.10

Field Data Sheet

Client: Church Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s)): CES/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-6 Well Locked: YES NO - Broken Locks

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 27.93 ft Multi Factor*: 1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 6.97 ft Casing Volume: 3.41 gallons

Height of Water Column: 20.96 ft Cal. 3 Volumes: 10.24 gallons

Purge Information

Date Purged: 04 / 05 / 16 Start Time: 1445 Finish: 1615 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 9000 ~~gallons~~ ml

Sampling Information

Date Collected: 04/05/16 Time Collected: 1615 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RAD vs, metals x2,
		8260x3, TDS,
		Fluoride, chloride/
		sulfate

Field Measurements/Observations

Sample Temp (°C): 14.8 Time: 1615 Turbidity (ntu): 9.9 Time: 1615

Sample pH (s.u.): 6.4 Time: Diss Oxy (mg/L): 0.1 Time: 1615

Specific Cond. (uS): 1296 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 161.8 Time: Other: Iron 0.0mg/L Time: 1615

Odor: None Time: Appearance: Cloudy/clear

General/Weather Observations

Sunny 54°F. Wind 10-20mph. Walk to well. Turbidity = ↑↓

Sampler Signature/Date: [signature] 04/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water level (ft)
1450	7.0	1521	164.8	5.4	0.2	15.2	500ml	7.55
1455	6.6	1519	165.4	7.9	0.1	14.8	1000ml	7.75
1500	6.6	1517	165.7	18.0	0.1	15.6	1500ml	7.85
1505	6.6	1507	158.1	26.0	0.1	15.5	2000ml	7.95
1515	6.5	1476	158.8	25.0	0.1	15.6	~~2500ml~~ 3000ml	7.97

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Client: Charah

Location: Monroe, NC

Project: Brickhaven

Well ID: MW-6

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water level: (ft)
1525	6.5	1455	160.1	14.8	0.1	15.3	4000ml	8.00
1535	6.5	1367	162.6	13.5	0.1	14.8	5000ml	8.02
1545	6.5	1339	163.6	16.3	0.1	14.5	6000ml	8.05
1555	6.4	1289	161.4	16.1	0.1	14.8	7000ml	stable
1605	6.4	1289	161.4	12.7	0.1	14.9	8000ml		
1615	6.4	1296	161.8	9.9	0.1	14.8	9000ml		

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Field Data Sheet

Client: Charah Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: BG-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.78 ft Multi Factor*: 1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 9.73 ft Casing Volume: 5.55 gallons

Height of Water Column: 34.05 ft Cal. 3 Volumes: 16.65 gallons

Purge Information

Date Purged: 04/05/16 Start Time: 1055 Finish: 1120 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 2500 mL ~~gallons~~

Sampling Information

Date Collected: 04/05/16 Time Collected: 1120 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RAD, x3, metals x2, 8260 x3, TDS, Fluoride, Chloride/ Sulfate

Field Measurements/Observations

Sample Temp (°C): 13.0 Time: 1120 Turbidity (ntu): 0.9 Time: 1120

Sample pH (s.u.): 6.6 Time: Diss Oxy (mg/L): 1.9 Time: 1120

Specific Cond. (uS): 1199 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 168.5 Time: Other: Iron 0.0 mg/L Time: 1120

Odor: None Time: Appearance: Clear

General/Weather Observations

Wind, 10-15 mph. Cloudy 50°F, No recharge

Sampler Signature/Date: [signature] /04/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1100	6.5	1195	148.3	1.6	2.0	13.2	500mL	10.30
1105	6.6	1198	157.1	1.5	1.9	13.0	1000mL	10.70
1110	6.6	1198	162.2	1.1	~~1.1~~ 1.9	13.8	1500mL	10.80
1115	6.6	1197	165.8	1.6	1.9	13.3	2000mL	10.90
1120	6.6	1199	168.5	0.9	1.9	13.0	2500mL	11.00

Field Data Sheet

Client: Charah Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SL-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 04/05/16 Time Collected: 1020 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		Radium 22/228 x3
		metals x2, TDS
		Fluoride, chloride/sulfate,
		826 x3

Field Measurements/Observations

Sample Temp (°C): 11.2 Time: 1020 Turbidity (ntu): 120.7 Time: 1020

Sample pH (s.u.): 6.9 Time: _____ Diss Oxy (mg/L): 6.1 Time: 1020

Specific Cond. (uS): 79.8 Time: _____ Res. Cl (mg/L): — Time: —

ReDox (mV): 107.6 Time: _____ Other: Iron 0.0mg/L Time: 1020

Odor: None Time: _____ Appearance: orange tint

General/Weather Observations

Wind. 15-25mph. Sunny/Cloudy 50°F.

Sampler Signature/Date: [signature] 04/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
				120.7				

Field Data Sheet

Client: Charter Location: Monroe, NC Project Name/#: Brickshaven

Name and Afiliation (Sampler(s)): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-2 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ____/____/____ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 04/05/16 Time Collected: 0940 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RAD x3, metals x2,
		8260 x3, TDS
		Fluoride, Chloride/
		Sulfate

Field Measurements/Observations

Sample Temp (°C): 13.8 Time: 0940 Turbidity (ntu): 51.6 Time: 0940

Sample pH (s.u.): 6.5 Time: — Diss Oxy (mg/L): 5.7 Time: 0940

Specific Cond. (uS): 211.0 Time: — Res. Cl (mg/L): — Time: —

ReDox (mV): 51.0 Time: — Other: Iron 0.5 mg/L Time: 0940

Odor: None Time: — Appearance: Brown tint

General/Weather Observations

Wind, 15-20 mph Sunny / cloudy, 50°F

Sampler Signature/Date: [signature] / 04/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Field Data Sheet

Client: Charah Location: Marion, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s)): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: Leachate-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: 100 mL/min

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 04/05/16 Time Collected: 1410 am pm

Sampling Equipment Used: Grab / Spigot

Bottle Type	Preservation	Analysis Required
		RA226, RA228,
		8260x3, TDS
		Fluoride, chloride/
		Sulfate

Field Measurements/Observations

Sample Temp (°C): 15.4 Time: 1410 Turbidity (ntu): 9.5 Time: 1410

Sample pH (s.u.): 7.7 Time: | Diss Oxy (mg/L): 6.4 Time: 1410

Specific Cond. (uS): 766 Time: | Res. Cl (mg/L): — Time: —

ReDox (mV): 169.4 Time: | Other: Iron 0.0 mg/L Time: 1410

Odor: None Time: | Appearance: Clear

General/Weather Observations

Sunny, 52°F, wind 10-20 mph, leachate on side of water tank

Sampler Signature/Date: [signature] 04/05/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cmath - Brickhaven

Name and Afiliation (Sampler(s)): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-1 Well Locked: YES NO - Broken Locks

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 75.55 ft Multi Factor*: 1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 58.25 ft Casing Volume: 2.81 gallons

Height of Water Column: 17.3 ft Cal. 3 Volumes: 8.45 gallons

Purge Information

Date Purged: 04/06/16 Start Time: 1215 Finish: 1325 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 7,000 ~~gallons~~ mL

Sampling Information

Date Collected: 04/06/16 Time Collected: 1325 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RADx3, metals x2,
		8260x3, TDS,
		Fluoride,
		chloride/sulfate

Field Measurements/Observations

Sample Temp (°C): 18.0 Time: 1325 Turbidity (ntu): 8.4 Time: 1325

Sample pH (s.u.): 6.7 Time: — Diss Oxy (mg/L): 0.02 Time: 1325

Specific Cond. (uS): 1399 Time: — Res. Cl (mg/L): — Time: —

ReDox (mV): 37.8 Time: — Other: Iron 0.0 mg/L Time: 1325

Odor: None Time: — Appearance: Clear

General/Weather Observations

Sunny, 54°F wind: 5-10 mph. Good recharge. FD: 1345

Sampler Signature/Date: [signature] / 04/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1220	7.3	538.0	39.2	197.1	0.1	17.7	500mL	58.47
1225	7.2	537.7	10.3	151.2	0.1	17.7	1000mL	58.50
1235	7.1	626	3.9	90.4	0.1	17.8	2000mL	58.52
1245	7.0	824	10.0	69.2	0.1	17.8	3000mL	58.50
1255	6.8	1077	21.5	42.3	0.04	17.9	4000mL	58.50

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Client: HDR

Location: Monroe, NC

Project: Church - Brickhaven

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level: (ft)
1305	6.8	1247	30.1	22.1	0.03	18.0	500mL	58.50
1315	6.7	1361	36.0	12.4	0.03	18.0	6000mL	Stable
1320	6.7	1392	37.6	9.7	0.03	18.0	6500mL	↓
1325	6.7	1399	37.8	8.4	0.02	18.0	7000mL	↓

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charah-Brickshaven

Name and Afiliation (Sampler(s): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-2 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 48.13 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 28.80 ft Casing Volume: 3.15 gallons

Height of Water Column: 19.33 ft Cal. 3 Volumes: 9.45 gallons

Purge Information

Date Purged: 04 / 06 / 16 Start Time: 1415 Finish: 1630 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 13,500 mL ~~gallons~~ CS

Sampling Information

Date Collected: 04/06/16 Time Collected: 1630 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RAD x3, metals x2,
		8260 x3, TDS,
		Fluoride
		Chloride/Sulfate

Field Measurements/Observations

Sample Temp (°C): 18.6 Time: 1630 Turbidity (ntu): 24.4 Time: 1630

Sample pH (s.u.): 7.6 Time: Diss Oxy (mg/L): 2.4 Time: 1630

Specific Cond. (uS): 4542 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 138.2 Time: Other: Iron: 0.0 mg/L Time: 1630

Odor: None Time: — Appearance: Cloudy

General/Weather Observations

Sunny, 56°F Wind: 10-15 mph No recharge, Chromark Turb ↑ = sample

Sampler Signature/Date: [signature] / 04/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1420	7.4	4561	132.6	28.4	3.6	17.8	500mL	28.95
1430	7.5	4598	130.0	27.2	2.8	17.8	1500mL	29.45
1440	7.5	4559	129.2	66.4	2.4	18.3	2500mL	29.90
1450	7.5	4600	131.0	69.6	2.5	17.8	3500mL	30.15
1500	7.5	4531	131.9	99.8	2.2	18.4	4500mL	30.20

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Client: HDR

Location: Moncure, NC

Project: Cheatham - Brickhaven

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level: (ft)
1510	7.6	4545	135.9	87.1	2.5	18.7	5500ml	31.00
1520	7.5	4552	136.7	67.2	2.7	18.4	6500ml	32.00
1530	7.5	4549	136.8	48.4	2.7	18.4	7500ml	32.45
1540	7.6	4547	137.6	41.6	2.4	18.6	8500ml	32.90
1550	7.6	4548	137.8	38.1	2.4	18.5	9500ml	33.10
1600	7.6	4542	138.2	25.9	2.4	18.6	10,500ml	33.25
1610	STABLE	STABLE	STABLE	21.5	STABLE	STABLE	11,500ml	33.45
1620				21.4			12,500ml	2 hr mark
1630				24.4			13,500	Turb. ↑ = sample

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cherah / Brickshaven

Name and Afiliation (Sampler(s): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 17.64 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 16.05 ft Casing Volume: 0.25 gallons

Height of Water Column: 1.59 ft Cal. 3 Volumes: 0.77 gallons

Purge Information

Date Purged: 04 / 06 / 16 Start Time: 0935 Finish: 0955 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 2000 ~~gallons~~ mL

Sampling Information

Date Collected: 04/06/16 Time Collected: 0955 ~~am~~ ~~pm~~

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
	Limited Sample volume	RAD x3, metals x2, 8260 x3, TDS
	Only 2 RAS Pulled	Fluoride, Chloride/ -
	+ metals 8260, TDS Fluoride, chloride/sulfate	- sulfate

Field Measurements/Observations

Sample Temp (°C): 12.6 Time: 0955 Turbidity (ntu): 3.4 Time: 0955

Sample pH (s.u.): 6.6 Time: Diss Oxy (mg/L): 4.4 Time: 0955

Specific Cond. (uS): 1895 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 57.3 Time: Other: Iron, 0.0mg/L Time: 0955

Odor: None Time: Appearance:

General/Weather Observations

Limited sample volume & pull metals last

Sunny. 34°F wind: 10-15mph. Pulled sample to start.

Sampler Signature/Date: [signature] / 04/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
0940	6.5	1867	147.2	11.3	4.2	11.5	500mL	16.40
0945	6.6	1884	117.4	5.2	4.4	12.1	1000mL	16.50
0950	6.6	1887	86.7	5.4	4.4	12.3	1500mL	16.60
0955	6.6	1895	57.3	3.4	4.4	12.6	2000mL	16.70

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Chatham / Brickhaven

Name and Afiliation (Sampler(s)): CES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-8 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 49.68 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 36.98 ft Casing Volume: 1.63 gallons

Height of Water Column: 10.0 ft Cal. 3 Volumes: 4.89 gallons

Purge Information

Date Purged: 04 / 06 / 16 Start Time: 1045 Finish: 1140 Purge Rate: 100 ml/min

Purging Method: Monsoon Total Volume Purged: 5500 ~~gallons~~ ml

Sampling Information

Date Collected: 04/06/16 Time Collected: 1140 am ~~pm~~

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RAD x3, Metals x2,
		8260 x3, TDS,
		Fluoride, Chloride/-
		- Sulfate

Field Measurements/Observations

Sample Temp (°C): 16.9 Time: 1140 Turbidity (ntu): 5.9 Time: 1140

Sample pH (s.u.): 6.8 Time: Diss Oxy (mg/L): 1.1 Time: 1140

Specific Cond. (uS): 2620 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 119.6 Time: Other: Iron, 0.0mg/L Time: 1140

Odor: None Time: Appearance: Clear

General/Weather Observations

Sunny, 46°F. wind 10-15 mph. walk to well

Sampler Signature/Date: [signature] 04/06/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other water level (ft)
1050	6.6	4057	145.7	88.70	2.8	16.5	500ml	37.70
1055	6.6	4007	144.9	73.66	2.7	16.7	1000ml	37.75
1105	6.7	3627	139.5	35.00	2.3	16.9	2000ml	38.25
1115	6.7	3008	129.1	14.1	1.5	17.0	3000ml	38.55
1120	6.7	2858	126.1	10.5	1.4	16.9	~~4000ml~~ 3500ml	38.55

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Client: HDR

Location: Monroe, NC

Project: Church - Buckhaven

Well ID: MW-8

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1125	6.7	2400	125.0	7.8	1.3	16.9	400ml	38.55
1130	6.8	2655	120.7	6.1	1.1	17.2	450ml	Stable
1135	6.8	2649	119.4	6.2	1.1	17.1	500ml	|
1140	6.8	2620	118.6	5.9	1.1	16.9	550ml	|

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Field Data Sheet

Client: HDR Location: Mooresville, NC Project Name/#: Cherah-Brickhaven

Name and Afiliation (Sampler(s): GES / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-3 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.60 ft Multi Factor*: .1636 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.20 ft Casing Volume: 5.44 gallons

Height of Water Column: 33.40 ft Cal. 3 Volumes: 16.33 gallons

Purge Information

Date Purged: 04 / 07 / 16 Start Time: 0940 Finish: 1005 Purge Rate: 100 ml/min

Purging Method: Peristaltic Total Volume Purged: 2500 ~~gallons~~ mL

Sampling Information

Date Collected: 04/07/16 Time Collected: 1005 am ~~pm~~

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RADs x5, metals x2
		8260 x3, TDS,
		Fluoride, Chloride/
		- Sulfate

Field Measurements/Observations

Sample Temp (°C): 15.9 Time: 1005 Turbidity (ntu): 1.2 Time: 1005

Sample pH (s.u.): 7.1 Time: Diss Oxy (mg/L): 3.7 Time: 1005

Specific Cond. (uS): 4299 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 172.0 Time: Other: Iron 0.0 mg/L Time: 1005

Odor: None Time: Appearance: Clear

General/Weather Observations

Cloudy, 54°F wind 15mph, No rechase

Sampler Signature/Date: [signature] / 04/07/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
0945	6.7	4296	177.6	2.5	4.0	16.1	500ml	10.80
0950	7.0	4296	173.7	2.0	3.8	15.8	1000ml	11.68
0955	7.1	4300	172.6	0.8	3.7	15.9	1500ml	12.55
1000	7.1	4297	172.2	1.3	3.7	15.9	2000ml	13.00
1005	7.1	4299	172.0	1.2	3.7	15.9	2500ml	13.50

Field Data Sheet

Client: HDR Location: Mercure, NC Project Name/#: Charah - Brickhaven

Name and Afiliation (Sampler(s)): CES/PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-4 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 25.74 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 8.79 ft Casing Volume: 2.76 gallons

Height of Water Column: 16.95 ft Cal. 3 Volumes: 8.28 gallons

Purge Information

Date Purged: 04 / 07 / 16 Start Time: 1050 Finish: 1255 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 12,500 ~~gallons~~ mL US

Sampling Information

Date Collected: 04/07/16 Time Collected: 1255 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		RADx3, 8260x3,
		Metals x2, TDS,
		Fluoride, chloride/
		- Sulfate

Field Measurements/Observations

Sample Temp (°C): 17.6 Time: 1255 Turbidity (ntu): 22.5 Time: 1255

Sample pH (s.u.): 6.4 Time: Diss Oxy (mg/L): 0.1 Time: 1255

Specific Cond. (uS): 985 Time: Res. Cl (mg/L): — Time:

ReDox (mV): 10.1 Time: Other: Iron, 1.5 mg/L Time: 1255

Odor: None Time: Appearance: Cloudy w/ Floc → Clear w/ Floc @ 2 hr mark - Sample

General/Weather Observations

Cloudy, 57°F, wind, 10-15 mph. Next to Future Cell - Dirty Pond water

Sampler Signature/Date: [signature] / 04/07/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other Water Level (ft)
1055	6.8	1129	-5.3	53.0	0.3	15.7	500mL	9.50
1105	6.5	1123	-0.4	15.4	0.2	15.9	1500mL	9.85
1110	6.5	1111	0.5	13.6	0.1	16.1	2000mL	10.00
1115	6.5	1091	0.3	13.3	0.1	16.4	2500mL	10.05
1120	6.5	1071	0.1	14.1	0.1	16.3	3000mL	10.10

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Charah - Brickhaven

Well ID: MW-4

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
								Water Level (ft)
1125	6.5	1060	-0.1	20.2	0.1	16.6	3500mL	10.15
1135	6.4	1010	1.8	22.5	0.1	17.0	4500mL	10.20
1145	6.4	1003	1.2	28.0	0.1	16.7	5500mL	10.10
1155	6.4	1014	3.2	26.7	0.2	16.8	6500mL	10.00
1205	6.4	993	5.8	41.9	0.1	17.4	7500mL	
1215	6.4	989	9.5	29.1	0.1	17.0	8500mL	
1225	6.4	985	10.1	20.6	0.1	17.6	9500mL	
1235	STABLE	STABLE		18.9	STABLE	STABLE	10500mL	
1245				20.80			11500mL	
1255				22.5			12500mL	2 hr mark

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Cheraw-Brickhaven

Name and Afiliation (Sampler(s): CES/PAE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 (24hr ✓) Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 17.64 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 17.25 ft Casing Volume: .063 gallons

Height of Water Column: 0.39 ft Cal. 3 Volumes: 0.19 gallons) RY

Purge Information

Date Purged: 04 / 07 / 16 Start Time: 1330 Finish: 1332 Purge Rate: 100ml/min

Purging Method: Peristaltic Total Volume Purged: _____ gallons

Sampling Information

Date Collected: _____ Time Collected: _____ am pm

Sampling Equipment Used: _____

Bottle Type	Preservation	Analysis Required
		X RAD 226/228 (1) (Not enough H2O)

Field Measurements/Observations

Sample Temp (°C): _____ Time: _____ Turbidity (ntu): _____ Time: _____

Sample pH (s.u.): _____ Time: _____ Diss Oxy (mg/L): _____ Time: _____

Specific Cond. (uS): _____ Time: _____ Res. Cl (mg/L): _____ Time: _____

ReDox (mV): _____ Time: _____ Other: _____ Time: _____

Odor: _____ Time: _____ Appearance: _____

General/Weather Observations

24 hr ✓ - Not enough H2O on 04/06/16

Sampler Signature/Date: [signature]

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

B

Appendix B – 4th,5th, & 6th Round Laboratory Reports and Chains of Custody

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

January 28, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 05, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92281799001	**SW-2**	Water	01/04/16 08:55	01/05/16 12:30
92281799002	**SW-1**	Water	01/04/16 09:35	01/05/16 12:30
92281799003	**BG-1**	Water	01/04/16 11:52	01/05/16 12:30
92281799004	**MW-5**	Water	01/04/16 13:25	01/05/16 12:30
92281799005	**LEACHATE-1**	Water	01/04/16 13:45	01/05/16 12:30
92281799006	**MW-4**	Water	01/04/16 15:15	01/05/16 12:30
92281799007	**AMBIENT BLANK**	Water	01/04/16 17:00	01/05/16 12:30
92281799008	**EQUIPMENT BLANK**	Water	01/04/16 17:30	01/05/16 12:30
92281799009	**TRIP BLANK**	Water	01/04/16 00:00	01/05/16 12:30

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SAMPLE ANALYTE COUNT

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92281799001	**SW-2**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799002	**SW-1**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799003	**BG-1**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799004	**MW-5**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799005	**LEACHATE-1**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799006	**MW-4**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799007	**AMBIENT BLANK**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799008	**EQUIPMENT BLANK**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92281799009	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92281799001	**SW-2**					
EPA 300.0	Chloride	6.7	mg/L	1.0	01/11/16 10:34	
EPA 300.0	Sulfate	9.4	mg/L	1.0	01/11/16 10:34	
EPA 6010	Barium	56.1	ug/L	5.0	01/07/16 19:40	
EPA 6010	Calcium	6220	ug/L	100	01/07/16 19:40	
EPA 6010	Thallium	11.4	ug/L	5.4	01/07/16 19:40	M1
EPA 6010	Zinc	14.2	ug/L	10.0	01/07/16 19:40	
EPA 6020A	Boron	18.2	ug/L	5.0	01/08/16 12:30	
EPA 6020A	Lithium	0.78	ug/L	0.50	01/08/16 12:30	
EPA 903.1	Radium-226	-0.213 ± 0.590 (1.00) C:NA T:60%	pCi/L		01/25/16 18:37	
EPA 904.0	Radium-228	0.833 ± 0.990 (2.05) C:88% T:29%	pCi/L		01/22/16 13:01	
SM 2540C	Total Dissolved Solids	72.0	mg/L	25.0	01/06/16 10:49	D6
92281799002	**SW-1**					
EPA 300.0	Chloride	7.6	mg/L	1.0	01/11/16 11:41	
EPA 300.0	Fluoride	0.12	mg/L	0.10	01/11/16 11:41	
EPA 300.0	Sulfate	18.2	mg/L	1.0	01/11/16 11:41	
EPA 6010	Barium	82.8	ug/L	5.0	01/07/16 19:49	
EPA 6010	Calcium	4080	ug/L	100	01/07/16 19:49	
EPA 6010	Thallium	12.9	ug/L	5.4	01/07/16 19:49	
EPA 6010	Vanadium	8.9	ug/L	5.0	01/07/16 19:49	
EPA 6010	Zinc	12.8	ug/L	10.0	01/07/16 19:49	
EPA 6020A	Boron	12.7	ug/L	5.0	01/08/16 12:17	
EPA 6020A	Lithium	2.4	ug/L	0.50	01/08/16 12:17	
EPA 903.1	Radium-226	0.390 ± 0.510 (0.841) C:NA T:76%	pCi/L		01/25/16 18:37	
EPA 904.0	Radium-228	0.543 ± 0.472 (0.923) C:88% T:57%	pCi/L		01/22/16 13:01	
SM 2540C	Total Dissolved Solids	205	mg/L	25.0	01/06/16 10:50	
92281799003	**BG-1**					
EPA 300.0	Chloride	285	mg/L	5.0	01/12/16 02:41	
EPA 300.0	Fluoride	0.13	mg/L	0.10	01/11/16 12:04	
EPA 300.0	Sulfate	19.5	mg/L	1.0	01/11/16 12:04	
EPA 6010	Barium	310	ug/L	5.0	01/07/16 19:52	
EPA 6010	Calcium	28600	ug/L	100	01/07/16 19:52	
EPA 6020A	Boron	7.5	ug/L	5.0	01/08/16 12:20	
EPA 6020A	Lithium	15.0	ug/L	0.50	01/08/16 12:20	

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92281799003	**BG-1**					
EPA 903.1	Radium-226	-0.206 ± 0.315 (0.827) C:NA T:96%	pCi/L		01/25/16 19:31	
EPA 904.0	Radium-228	0.808 ± 0.449 (0.817) C:81% T:76%	pCi/L		01/27/16 16:53	2g
SM 2540C	Total Dissolved Solids	643	mg/L	25.0	01/06/16 10:50	
92281799004	**MW-5**					
EPA 300.0	Chloride	21.9	mg/L	1.0	01/11/16 12:26	
EPA 300.0	Fluoride	0.56	mg/L	0.10	01/11/16 12:26	
EPA 300.0	Sulfate	4.1	mg/L	1.0	01/11/16 12:26	
EPA 6010	Barium	102	ug/L	5.0	01/07/16 19:55	
EPA 6010	Calcium	13500	ug/L	100	01/07/16 19:55	
EPA 6020A	Boron	10.8	ug/L	5.0	01/08/16 12:23	
EPA 6020A	Lithium	6.4	ug/L	0.50	01/08/16 12:23	
EPA 903.1	Radium-226	-0.066 ± 0.299 (0.705) C:NA T:89%	pCi/L		01/25/16 19:12	
EPA 904.0	Radium-228	0.425 ± 0.376 (0.762) C:86% T:76%	pCi/L		01/27/16 16:52	2g
SM 2540C	Total Dissolved Solids	259	mg/L	25.0	01/06/16 10:53	
92281799005	**LEACHATE-1**					
EPA 300.0	Sulfate	9.9	mg/L	1.0	01/11/16 12:48	
EPA 6010	Barium	34.8	ug/L	5.0	01/07/16 19:58	
EPA 6010	Calcium	10700	ug/L	100	01/07/16 19:58	
EPA 6010	Vanadium	5.6	ug/L	5.0	01/07/16 19:58	
EPA 6010	Zinc	15.2	ug/L	10.0	01/07/16 19:58	
EPA 6020A	Boron	34.5	ug/L	5.0	01/08/16 12:25	
EPA 6020A	Lithium	2.2	ug/L	0.50	01/08/16 12:25	
EPA 903.1	Radium-226	0.000 ± 0.398 (0.842) C:NA T:90%	pCi/L		01/25/16 19:19	
EPA 904.0	Radium-228	0.497 ± 0.395 (0.782) C:81% T:75%	pCi/L		01/27/16 16:52	2g
SM 2540C	Total Dissolved Solids	40.0	mg/L	25.0	01/06/16 10:54	
92281799006	**MW-4**					
EPA 300.0	Chloride	307	mg/L	6.0	01/12/16 03:10	
EPA 300.0	Fluoride	0.35	mg/L	0.10	01/11/16 13:11	
EPA 300.0	Sulfate	6.3	mg/L	1.0	01/11/16 13:11	

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92281799006	**MW-4**					
EPA 6010	Barium	176	ug/L	5.0	01/07/16 20:01	
EPA 6010	Calcium	35200	ug/L	100	01/07/16 20:01	
EPA 6020A	Boron	7.2	ug/L	5.0	01/08/16 12:28	
EPA 6020A	Lithium	23.2	ug/L	0.50	01/08/16 12:28	
EPA 903.1	Radium-226	-0.120 ± 0.374 (0.849) C:NA T:98%	pCi/L		01/25/16 19:55	
EPA 904.0	Radium-228	0.481 ± 0.382 (0.758) C:85% T:76%	pCi/L		01/27/16 16:52	2g
SM 2540C	Total Dissolved Solids	806	mg/L	50.0	01/06/16 10:55	
92281799007	**AMBIENT BLANK**					
EPA 903.1	Radium-226	0.0592 ± 0.270 (0.550) C:NA T:96%	pCi/L		01/25/16 19:01	
EPA 904.0	Radium-228	0.876 ± 0.442 (0.783) C:87% T:79%	pCi/L		01/27/16 16:52	2g
92281799008	**EQUIPMENT BLANK**					
EPA 8260	Methylene Chloride	4.2	ug/L	1.0	01/06/16 14:52	C9
EPA 903.1	Radium-226	-0.132 ± 0.301 (0.710) C:NA T:88%	pCi/L		01/25/16 19:08	
EPA 904.0	Radium-228	0.491 ± 0.388 (0.766) C:85% T:72%	pCi/L		01/27/16 16:52	2g

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: SW-2 **Lab ID: 92281799001** Collected: 01/04/16 08:55 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**6.7**	mg/L	1.0	1		01/11/16 10:34	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 10:34	16984-48-8	
Sulfate	**9.4**	mg/L	1.0	1		01/11/16 10:34	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:40	7440-38-2	
Barium	**56.1**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:40	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:40	7440-43-9	
Calcium	**6220**	ug/L	100	1	01/06/16 13:55	01/07/16 19:40	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:07	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:40	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-22-4	
Thallium	**11.4**	ug/L	5.4	1	01/06/16 13:55	01/07/16 19:40	7440-28-0	M1
Vanadium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:40	7440-62-2	
Zinc	**14.2**	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:40	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**18.2**	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:30	7440-42-8	
Lithium	**0.78**	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:30	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 15:45	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 12:36	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 12:36	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 12:36	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 12:36	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 12:36	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 12:36	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 12:36	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 12:36	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 12:36	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 12:36	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 12:36	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 12:36	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 12:36	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 12:36	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 12:36	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: SW-2 **Lab ID: 92281799001** Collected: 01/04/16 08:55 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 12:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 12:36	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 12:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 12:36	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 12:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 12:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 12:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 12:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 12:36	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 12:36	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 12:36	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 12:36	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 12:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 12:36	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 12:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 12:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 12:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 12:36	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 12:36	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 12:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 12:36	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 12:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 12:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 12:36	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 12:36	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 12:36	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 12:36	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	112	%	70-130	1		01/06/16 12:36	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/06/16 12:36	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		01/06/16 12:36	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**72.0**	mg/L	25.0	1		01/06/16 10:49		D6

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: SW-1 **Lab ID: 92281799002** Collected: 01/04/16 09:35 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**7.6**	mg/L	1.0	1		01/11/16 11:41	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		01/11/16 11:41	16984-48-8	
Sulfate	**18.2**	mg/L	1.0	1		01/11/16 11:41	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:49	7440-38-2	
Barium	**82.8**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:49	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:49	7440-43-9	
Calcium	**4080**	ug/L	100	1	01/06/16 13:55	01/07/16 19:49	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:16	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:49	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-22-4	
Thallium	**12.9**	ug/L	5.4	1	01/06/16 13:55	01/07/16 19:49	7440-28-0	
Vanadium	**8.9**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:49	7440-62-2	
Zinc	**12.8**	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:49	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**12.7**	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:17	7440-42-8	
Lithium	**2.4**	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:17	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 15:52	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 12:53	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 12:53	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 12:53	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 12:53	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 12:53	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 12:53	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 12:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 12:53	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 12:53	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 12:53	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 12:53	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 12:53	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 12:53	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 12:53	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 12:53	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: SW-1 **Lab ID: 92281799002** Collected: 01/04/16 09:35 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 12:53	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 12:53	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 12:53	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 12:53	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 12:53	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 12:53	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:53	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 12:53	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 12:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 12:53	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 12:53	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 12:53	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 12:53	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 12:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 12:53	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 12:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 12:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 12:53	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 12:53	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 12:53	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 12:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 12:53	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 12:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 12:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 12:53	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 12:53	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 12:53	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 12:53	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	114	%	70-130	1		01/06/16 12:53	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/06/16 12:53	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/06/16 12:53	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**205**	mg/L	25.0	1		01/06/16 10:50		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: BG-1 **Lab ID: 92281799003** Collected: 01/04/16 11:52 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**285**	mg/L	5.0	5		01/12/16 02:41	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		01/11/16 12:04	16984-48-8	
Sulfate	**19.5**	mg/L	1.0	1		01/11/16 12:04	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:52	7440-38-2	
Barium	**310**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:52	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:52	7440-43-9	
Calcium	**28600**	ug/L	100	1	01/06/16 13:55	01/07/16 19:52	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:19	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:52	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/06/16 13:55	01/07/16 19:52	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:52	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:52	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**7.5**	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:20	7440-42-8	
Lithium	**15.0**	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:20	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 15:54	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 13:27	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 13:27	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 13:27	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 13:27	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 13:27	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 13:27	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 13:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 13:27	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 13:27	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 13:27	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 13:27	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 13:27	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 13:27	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 13:27	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 13:27	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: BG-1 **Lab ID: 92281799003** Collected: 01/04/16 11:52 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 13:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 13:27	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 13:27	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 13:27	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 13:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 13:27	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 13:27	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 13:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 13:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 13:27	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 13:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 13:27	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 13:27	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 13:27	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 13:27	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 13:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 13:27	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 13:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 13:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 13:27	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 13:27	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 13:27	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 13:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 13:27	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 13:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 13:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 13:27	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 13:27	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 13:27	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 13:27	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	110	%	70-130	1		01/06/16 13:27	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		01/06/16 13:27	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		01/06/16 13:27	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**643**	mg/L	25.0	1		01/06/16 10:50		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: MW-5 **Lab ID: 92281799004** Collected: 01/04/16 13:25 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**21.9**	mg/L	1.0	1		01/11/16 12:26	16887-00-6	
Fluoride	**0.56**	mg/L	0.10	1		01/11/16 12:26	16984-48-8	
Sulfate	**4.1**	mg/L	1.0	1		01/11/16 12:26	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:55	7440-38-2	
Barium	**102**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:55	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:55	7440-43-9	
Calcium	**13500**	ug/L	100	1	01/06/16 13:55	01/07/16 19:55	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:32	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:55	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/06/16 13:55	01/07/16 19:55	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:55	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:55	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**10.8**	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:23	7440-42-8	
Lithium	**6.4**	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:23	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 15:57	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 13:44	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 13:44	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 13:44	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 13:44	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 13:44	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 13:44	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 13:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 13:44	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 13:44	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 13:44	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 13:44	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 13:44	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 13:44	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 13:44	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 13:44	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: MW-5 **Lab ID: 92281799004** Collected: 01/04/16 13:25 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 13:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 13:44	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 13:44	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 13:44	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 13:44	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 13:44	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 13:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 13:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 13:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 13:44	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 13:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 13:44	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 13:44	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 13:44	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 13:44	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 13:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 13:44	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 13:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 13:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 13:44	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 13:44	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 13:44	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 13:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 13:44	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 13:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 13:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 13:44	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 13:44	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 13:44	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 13:44	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	110	%	70-130	1		01/06/16 13:44	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		01/06/16 13:44	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		01/06/16 13:44	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**259**	mg/L	25.0	1		01/06/16 10:53		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: LEACHATE-1 **Lab ID: 92281799005** Collected: 01/04/16 13:45 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/11/16 12:48	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 12:48	16984-48-8	
Sulfate	**9.9**	mg/L	1.0	1		01/11/16 12:48	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:58	7440-38-2	
Barium	**34.8**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:58	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 19:58	7440-43-9	
Calcium	**10700**	ug/L	100	1	01/06/16 13:55	01/07/16 19:58	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:35	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:58	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/06/16 13:55	01/07/16 19:58	7440-28-0	
Vanadium	**5.6**	ug/L	5.0	1	01/06/16 13:55	01/07/16 19:58	7440-62-2	
Zinc	**15.2**	ug/L	10.0	1	01/06/16 13:55	01/07/16 19:58	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**34.5**	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:25	7440-42-8	
Lithium	**2.2**	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:25	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:06	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 14:01	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 14:01	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 14:01	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 14:01	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 14:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 14:01	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 14:01	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 14:01	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 14:01	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 14:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 14:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 14:01	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 14:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 14:01	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 14:01	124-48-1	

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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: LEACHATE-1 **Lab ID: 92281799005** Collected: 01/04/16 13:45 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 14:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:01	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:01	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 14:01	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:01	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 14:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:01	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 14:01	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 14:01	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 14:01	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 14:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 14:01	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 14:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 14:01	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 14:01	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 14:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 14:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 14:01	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 14:01	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 14:01	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 14:01	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	112	%	70-130	1		01/06/16 14:01	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		01/06/16 14:01	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/06/16 14:01	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**40.0**	mg/L	25.0	1		01/06/16 10:54		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: MW-4 **Lab ID: 92281799006** Collected: 01/04/16 15:15 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**307**	mg/L	6.0	6		01/12/16 03:10	16887-00-6	
Fluoride	**0.35**	mg/L	0.10	1		01/11/16 13:11	16984-48-8	
Sulfate	**6.3**	mg/L	1.0	1		01/11/16 13:11	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:01	7440-38-2	
Barium	**176**	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 20:01	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 20:01	7440-43-9	
Calcium	**35200**	ug/L	100	1	01/06/16 13:55	01/07/16 20:01	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:38	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:01	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/06/16 13:55	01/07/16 20:01	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:01	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:01	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**7.2**	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:28	7440-42-8	
Lithium	**23.2**	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:28	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:09	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 14:18	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 14:18	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 14:18	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 14:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 14:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 14:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 14:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 14:18	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 14:18	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 14:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 14:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 14:18	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 14:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 14:18	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 14:18	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: MW-4 **Lab ID: 92281799006** Collected: 01/04/16 15:15 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 14:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:18	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 14:18	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 14:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:18	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 14:18	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 14:18	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 14:18	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 14:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 14:18	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 14:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:18	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 14:18	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 14:18	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:18	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 14:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 14:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 14:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 14:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 14:18	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 14:18	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	110	%	70-130	1		01/06/16 14:18	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		01/06/16 14:18	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/06/16 14:18	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**806**	mg/L	50.0	1		01/06/16 10:55		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: AMBIENT BLANK **Lab ID: 92281799007** Collected: 01/04/16 17:00 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/11/16 13:33	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 13:33	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/11/16 13:33	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:14	7440-38-2	
Barium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 20:14	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 20:14	7440-43-9	
Calcium	ND	ug/L	100	1	01/06/16 13:55	01/07/16 20:14	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:45	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:14	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/06/16 13:55	01/07/16 20:14	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:14	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:14	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:45	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:45	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:11	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 14:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 14:35	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 14:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 14:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 14:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 14:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 14:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 14:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 14:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 14:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 14:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 14:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 14:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 14:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 14:35	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: AMBIENT BLANK **Lab ID: 92281799007** Collected: 01/04/16 17:00 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 14:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 14:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 14:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 14:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 14:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 14:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 14:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 14:35	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 14:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 14:35	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 14:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 14:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 14:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 14:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 14:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 14:35	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 14:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	111	%	70-130	1		01/06/16 14:35	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		01/06/16 14:35	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/06/16 14:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/06/16 10:55		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: EQUIPMENT BLANK **Lab ID: 92281799008** Collected: 01/04/16 17:30 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/11/16 13:55	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 13:55	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/11/16 13:55	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:17	7440-38-2	
Barium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 20:17	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/06/16 13:55	01/07/16 20:17	7440-43-9	
Calcium	ND	ug/L	100	1	01/06/16 13:55	01/07/16 20:17	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-48-4	
Copper	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-50-8	
Lead	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/06/16 13:55	01/08/16 15:48	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:17	7782-49-2	
Silver	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/06/16 13:55	01/07/16 20:17	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/06/16 13:55	01/07/16 20:17	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/06/16 13:55	01/07/16 20:17	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/08/16 08:37	01/08/16 12:51	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/08/16 08:37	01/08/16 12:51	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:13	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 14:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 14:52	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 14:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 14:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 14:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 14:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 14:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 14:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 14:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 14:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 14:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 14:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 14:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 14:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 14:52	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: EQUIPMENT BLANK **Lab ID: 92281799008** Collected: 01/04/16 17:30 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/06/16 14:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 14:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 14:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 14:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 14:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 14:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 14:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 14:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 14:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 14:52	74-88-4	
Methylene Chloride	**4.2**	ug/L	1.0	1		01/06/16 14:52	75-09-2	C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 14:52	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 14:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 14:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 14:52	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 14:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 14:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 14:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 14:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 14:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 14:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 14:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 14:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	111	%	70-130	1		01/06/16 14:52	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		01/06/16 14:52	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/06/16 14:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/06/16 10:56		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: TRIP BLANK **Lab ID: 92281799009** Collected: 01/04/16 00:00 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/06/16 12:19	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/06/16 12:19	107-13-1	
Benzene	ND	ug/L	1.0	1		01/06/16 12:19	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/06/16 12:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/06/16 12:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/06/16 12:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/06/16 12:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/06/16 12:19	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/06/16 12:19	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/06/16 12:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/06/16 12:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/06/16 12:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/06/16 12:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/06/16 12:19	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/06/16 12:19	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/06/16 12:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 12:19	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/06/16 12:19	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/06/16 12:19	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/06/16 12:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/06/16 12:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/06/16 12:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/06/16 12:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 12:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/06/16 12:19	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/06/16 12:19	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/06/16 12:19	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/06/16 12:19	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/06/16 12:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/06/16 12:19	108-10-1	
Styrene	ND	ug/L	1.0	1		01/06/16 12:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 12:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/06/16 12:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/06/16 12:19	127-18-4	
Toluene	ND	ug/L	1.0	1		01/06/16 12:19	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/06/16 12:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/06/16 12:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/06/16 12:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/06/16 12:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/06/16 12:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/06/16 12:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/06/16 12:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/06/16 12:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	111	%	70-130	1		01/06/16 12:19	460-00-4	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: TRIP BLANK **Lab ID: 92281799009** Collected: 01/04/16 00:00 Received: 01/05/16 12:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		01/06/16 12:19	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		01/06/16 12:19	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: GWD/2797 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 1644433 | Matrix: Water
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/11/16 09:49	
Fluoride	mg/L	ND	0.10	01/11/16 09:49	
Sulfate	mg/L	ND	1.0	01/11/16 09:49	

LABORATORY CONTROL SAMPLE: 1644434

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.0	98	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	50	48.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1644435 1644436

Parameter	Units	92281799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.7	50	50	57.2	58.2	101	103	90-110	2	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.5	96	97	90-110	1	20	
Sulfate	mg/L	9.4	50	50	59.9	60.6	101	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1644437 1644438

Parameter	Units	92282212001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	64.1	50	50	114	116	100	103	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	98	102	90-110	4	20	
Sulfate	mg/L	46.9	50	50	96.4	99.7	99	106	90-110	3	20	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: MERP/8849 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 1643385 Matrix: Water
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	01/11/16 15:40	

LABORATORY CONTROL SAMPLE: 1643386

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1643387 1643388

Parameter	Units	92281799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.5	2.4	97	94	75-125	3	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: MPRP/20423 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 1641719 | Matrix: Water
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/07/16 19:34	
Arsenic	ug/L	ND	10.0	01/07/16 19:34	
Barium	ug/L	ND	5.0	01/07/16 19:34	
Beryllium	ug/L	ND	1.0	01/07/16 19:34	
Cadmium	ug/L	ND	1.0	01/07/16 19:34	
Calcium	ug/L	ND	100	01/07/16 19:34	
Chromium	ug/L	ND	5.0	01/07/16 19:34	
Cobalt	ug/L	ND	5.0	01/07/16 19:34	
Copper	ug/L	ND	5.0	01/07/16 19:34	
Lead	ug/L	ND	5.0	01/07/16 19:34	
Molybdenum	ug/L	ND	5.0	01/08/16 15:01	
Nickel	ug/L	ND	5.0	01/07/16 19:34	
Selenium	ug/L	ND	10.0	01/07/16 19:34	
Silver	ug/L	ND	5.0	01/07/16 19:34	
Thallium	ug/L	ND	5.4	01/07/16 19:34	
Vanadium	ug/L	ND	5.0	01/07/16 19:34	
Zinc	ug/L	ND	10.0	01/07/16 19:34	

LABORATORY CONTROL SAMPLE: 1641720

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	501	100	80-120	
Arsenic	ug/L	500	472	94	80-120	
Barium	ug/L	500	496	99	80-120	
Beryllium	ug/L	500	495	99	80-120	
Cadmium	ug/L	500	494	99	80-120	
Calcium	ug/L	5000	4880	98	80-120	
Chromium	ug/L	500	488	98	80-120	
Cobalt	ug/L	500	485	97	80-120	
Copper	ug/L	500	498	100	80-120	
Lead	ug/L	500	480	96	80-120	
Molybdenum	ug/L	500	522	104	80-120	
Nickel	ug/L	500	489	98	80-120	
Selenium	ug/L	500	490	98	80-120	
Silver	ug/L	250	244	97	80-120	
Thallium	ug/L	500	449	90	80-120	
Vanadium	ug/L	500	486	97	80-120	
Zinc	ug/L	500	473	95	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1641721 1641722

Parameter	Units	92281799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	463	465	93	93	75-125	0	25	
Arsenic	ug/L	ND	500	500	443	444	88	89	75-125	0	25	
Barium	ug/L	56.1	500	500	513	519	91	93	75-125	1	25	
Beryllium	ug/L	ND	500	500	458	465	92	93	75-125	1	25	
Cadmium	ug/L	ND	500	500	459	461	92	92	75-125	0	25	
Calcium	ug/L	6220	5000	5000	10600	10500	88	85	75-125	1	25	
Chromium	ug/L	ND	500	500	455	462	91	92	75-125	2	25	
Cobalt	ug/L	ND	500	500	455	456	91	91	75-125	0	25	
Copper	ug/L	ND	500	500	466	472	92	94	75-125	1	25	
Lead	ug/L	ND	500	500	446	448	89	89	75-125	0	25	
Molybdenum	ug/L	ND	500	500	514	531	102	105	75-125	3	25	
Nickel	ug/L	ND	500	500	456	459	91	91	75-125	1	25	
Selenium	ug/L	ND	500	500	458	454	92	91	75-125	1	25	
Silver	ug/L	ND	250	250	225	227	90	91	75-125	1	25	
Thallium	ug/L	11.4	500	500	353	368	68	71	75-125	4	25	M1
Vanadium	ug/L	ND	500	500	461	465	91	92	75-125	1	25	
Zinc	ug/L	14.2	500	500	458	456	89	88	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: MPRP/60800 | Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 | Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 2171105 | Matrix: Water
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	01/08/16 12:15	
Lithium	ug/L	ND	0.50	01/08/16 12:15	

LABORATORY CONTROL SAMPLE: 2171106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	82.2	103	80-120	
Lithium	ug/L	80	79.7	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2171107 2171108

Parameter	Units	92281799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	18.2	80	80	102	103	104	106	80-120	1	20	
Lithium	ug/L	0.78	80	80	81.0	82.2	100	102	80-120	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: MSV/35063 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008, 92281799009

METHOD BLANK: 1641479 Matrix: Water
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008, 92281799009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/06/16 11:45	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/06/16 11:45	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/06/16 11:45	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/06/16 11:45	
1,1-Dichloroethane	ug/L	ND	1.0	01/06/16 11:45	
1,1-Dichloroethene	ug/L	ND	1.0	01/06/16 11:45	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/06/16 11:45	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/06/16 11:45	
1,2-Dichloroethane	ug/L	ND	1.0	01/06/16 11:45	
1,2-Dichloropropane	ug/L	ND	1.0	01/06/16 11:45	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/06/16 11:45	
2-Butanone (MEK)	ug/L	ND	5.0	01/06/16 11:45	
2-Hexanone	ug/L	ND	5.0	01/06/16 11:45	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/06/16 11:45	
Acetone	ug/L	ND	25.0	01/06/16 11:45	
Acrylonitrile	ug/L	ND	10.0	01/06/16 11:45	
Benzene	ug/L	ND	1.0	01/06/16 11:45	
Bromochloromethane	ug/L	ND	1.0	01/06/16 11:45	
Bromodichloromethane	ug/L	ND	1.0	01/06/16 11:45	
Bromoform	ug/L	ND	1.0	01/06/16 11:45	
Bromomethane	ug/L	ND	2.0	01/06/16 11:45	
Carbon disulfide	ug/L	ND	2.0	01/06/16 11:45	
Carbon tetrachloride	ug/L	ND	1.0	01/06/16 11:45	
Chlorobenzene	ug/L	ND	1.0	01/06/16 11:45	
Chloroethane	ug/L	ND	1.0	01/06/16 11:45	
Chloroform	ug/L	ND	1.0	01/06/16 11:45	
Chloromethane	ug/L	ND	1.0	01/06/16 11:45	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/06/16 11:45	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/06/16 11:45	
Dibromochloromethane	ug/L	ND	1.0	01/06/16 11:45	
Dibromomethane	ug/L	ND	1.0	01/06/16 11:45	
Ethylbenzene	ug/L	ND	1.0	01/06/16 11:45	
Iodomethane	ug/L	ND	5.0	01/06/16 11:45	
Methylene Chloride	ug/L	ND	1.0	01/06/16 11:45	
Styrene	ug/L	ND	1.0	01/06/16 11:45	
Tetrachloroethene	ug/L	ND	1.0	01/06/16 11:45	
Toluene	ug/L	ND	1.0	01/06/16 11:45	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/06/16 11:45	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/06/16 11:45	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/06/16 11:45	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

METHOD BLANK: 1641479 Matrix: Water

Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008, 92281799009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	01/06/16 11:45	
Trichlorofluoromethane	ug/L	ND	1.0	01/06/16 11:45	
Vinyl acetate	ug/L	ND	2.0	01/06/16 11:45	
Vinyl chloride	ug/L	ND	1.0	01/06/16 11:45	
Xylene (Total)	ug/L	ND	2.0	01/06/16 11:45	
1,2-Dichloroethane-d4 (S)	%	102	70-130	01/06/16 11:45	
4-Bromofluorobenzene (S)	%	110	70-130	01/06/16 11:45	
Toluene-d8 (S)	%	102	70-130	01/06/16 11:45	

LABORATORY CONTROL SAMPLE: 1641480

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	46.9	94	80-125	
1,1,1-Trichloroethane	ug/L	50	46.5	93	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	43.2	86	79-124	
1,1,2-Trichloroethane	ug/L	50	43.3	87	85-125	
1,1-Dichloroethane	ug/L	50	42.0	84	73-126	
1,1-Dichloroethene	ug/L	50	44.2	88	66-135	
1,2,3-Trichloropropane	ug/L	50	43.2	86	75-130	
1,2-Dichlorobenzene	ug/L	50	41.9	84	80-133	
1,2-Dichloroethane	ug/L	50	42.2	84	67-128	
1,2-Dichloropropane	ug/L	50	42.0	84	75-132	
1,4-Dichlorobenzene	ug/L	50	44.9	90	78-130	
2-Butanone (MEK)	ug/L	100	83.2	83	61-144	
2-Hexanone	ug/L	100	82.7	83	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	88.4	88	72-135	
Acetone	ug/L	100	88.7	89	48-146	
Acrylonitrile	ug/L	250	220	88	40-160	
Benzene	ug/L	50	42.9	86	80-125	
Bromochloromethane	ug/L	50	44.7	89	71-125	
Bromodichloromethane	ug/L	50	47.7	95	78-124	
Bromoform	ug/L	50	48.6	97	71-128	
Bromomethane	ug/L	50	53.0	106	40-160	
Carbon disulfide	ug/L	50	48.3	97	50-160	
Carbon tetrachloride	ug/L	50	48.8	98	69-131	
Chlorobenzene	ug/L	50	44.0	88	81-122	
Chloroethane	ug/L	50	46.1	92	39-148	
Chloroform	ug/L	50	44.9	90	73-127	
Chloromethane	ug/L	50	41.8	84	44-146	
cis-1,2-Dichloroethene	ug/L	50	43.4	87	74-124	
cis-1,3-Dichloropropene	ug/L	50	45.2	90	72-132	
Dibromochloromethane	ug/L	50	48.0	96	78-125	
Dibromomethane	ug/L	50	48.0	96	82-120	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

LABORATORY CONTROL SAMPLE: 1641480

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	44.1	88	79-121	
Iodomethane	ug/L	100	83.8	84	39-154	
Methylene Chloride	ug/L	50	43.4	87	64-133	
Styrene	ug/L	50	44.3	89	84-126	
Tetrachloroethene	ug/L	50	45.0	90	78-122	
Toluene	ug/L	50	45.0	90	80-121	
trans-1,2-Dichloroethene	ug/L	50	44.1	88	71-127	
trans-1,3-Dichloropropene	ug/L	50	45.4	91	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	46.5	93	40-160	
Trichloroethene	ug/L	50	45.3	91	78-122	
Trichlorofluoromethane	ug/L	50	47.7	95	53-137	
Vinyl acetate	ug/L	100	89.2	89	40-160	
Vinyl chloride	ug/L	50	43.5	87	58-137	
Xylene (Total)	ug/L	150	133	89	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			112	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE SAMPLE: 1641481

Parameter	Units	92281799001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.8	99	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.9	110	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.8	94	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.5	98	70-130	
1,1-Dichloroethane	ug/L	ND	20	19.6	98	70-130	
1,1-Dichloroethene	ug/L	ND	20	20.1	100	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.8	99	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	18.4	92	70-130	
1,2-Dichloroethane	ug/L	ND	20	19.4	97	70-130	
1,2-Dichloropropane	ug/L	ND	20	18.5	93	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	19.4	97	70-130	
2-Butanone (MEK)	ug/L	ND	40	38.3	96	70-130	
2-Hexanone	ug/L	ND	40	39.0	98	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	41.0	103	70-130	
Acetone	ug/L	ND	40	46.4	112	70-130	
Acrylonitrile	ug/L	ND	100	102	102	70-130	
Benzene	ug/L	ND	20	19.7	99	70-148	
Bromochloromethane	ug/L	ND	20	20.0	100	70-130	
Bromodichloromethane	ug/L	ND	20	21.6	108	70-130	
Bromoform	ug/L	ND	20	17.8	89	70-130	
Bromomethane	ug/L	ND	20	10.3	52	70-130	M1
Carbon disulfide	ug/L	ND	20	20.9	105	70-130	
Carbon tetrachloride	ug/L	ND	20	22.9	114	70-130	
Chlorobenzene	ug/L	ND	20	19.6	98	70-146	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

MATRIX SPIKE SAMPLE: 1641481

Parameter	Units	92281799001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	21.1	106	70-130	
Chloroform	ug/L	ND	20	20.2	101	70-130	
Chloromethane	ug/L	ND	20	15.9	80	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	19.8	99	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.4	97	70-130	
Dibromochloromethane	ug/L	ND	20	19.3	96	70-130	
Dibromomethane	ug/L	ND	20	21.6	108	70-130	
Ethylbenzene	ug/L	ND	20	19.3	96	70-130	
Iodomethane	ug/L	ND	40	27.6	69	70-130	M1
Methylene Chloride	ug/L	ND	20	18.8	94	70-130	
Styrene	ug/L	ND	20	18.9	95	70-130	
Tetrachloroethene	ug/L	ND	20	19.8	99	70-130	
Toluene	ug/L	ND	20	20.6	103	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	20.3	101	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.3	96	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	17.0	85	70-130	
Trichloroethene	ug/L	ND	20	20.6	103	69-151	
Trichlorofluoromethane	ug/L	ND	20	21.9	109	70-130	
Vinyl acetate	ug/L	ND	40	34.5	86	70-130	
Vinyl chloride	ug/L	ND	20	19.2	96	70-130	
1,2-Dichloroethane-d4 (S)	%				103	70-130	
4-Bromofluorobenzene (S)	%				113	70-130	
Toluene-d8 (S)	%				101	70-130	

SAMPLE DUPLICATE: 1641482

Parameter	Units	92281799002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

SAMPLE DUPLICATE: 1641482

Parameter	Units	92281799002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	101	101	0		
4-Bromofluorobenzene (S)	%	114	112	2		
Toluene-d8 (S)	%	100	101	1		

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: WET/42321 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 1641514 | Matrix: Water
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/06/16 10:48	

LABORATORY CONTROL SAMPLE: 1641515

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	256	102	90-110	

SAMPLE DUPLICATE: 1641516

Parameter	Units	92281799001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	72.0	67.0	7	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: SW-2 **Lab ID: 92281799001** Collected: 01/04/16 08:55 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.213 ± 0.590 (1.00) C:NA T:60%**	pCi/L	01/25/16 18:37	13982-63-3	
Radium-228	EPA 904.0	**0.833 ± 0.990 (2.05) C:88% T:29%**	pCi/L	01/22/16 13:01	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: SW-1 **Lab ID: 92281799002** Collected: 01/04/16 09:35 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.390 ± 0.510 (0.841)** **C:NA T:76%**	pCi/L	01/25/16 18:37	13982-63-3	
Radium-228	EPA 904.0	**0.543 ± 0.472 (0.923)** **C:88% T:57%**	pCi/L	01/22/16 13:01	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: BG-1 **Lab ID: 92281799003** Collected: 01/04/16 11:52 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.206 ± 0.315 (0.827) C:NA T:96%**	pCi/L	01/25/16 19:31	13982-63-3	
Radium-228	EPA 904.0	**0.808 ± 0.449 (0.817) C:81% T:76%**	pCi/L	01/27/16 16:53	15262-20-1	2g

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: MW-5 **Lab ID: 92281799004** Collected: 01/04/16 13:25 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.066 ± 0.299 (0.705)** **C:NA T:89%**	pCi/L	01/25/16 19:12	13982-63-3	
Radium-228	EPA 904.0	**0.425 ± 0.376 (0.762)** **C:86% T:76%**	pCi/L	01/27/16 16:52	15262-20-1	2g

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: LEACHATE-1 **Lab ID: 92281799005** Collected: 01/04/16 13:45 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.398 (0.842) C:NA T:90%**	pCi/L	01/25/16 19:19	13982-63-3	
Radium-228	EPA 904.0	**0.497 ± 0.395 (0.782) C:81% T:75%**	pCi/L	01/27/16 16:52	15262-20-1	2g

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: MW-4 **Lab ID: 92281799006** Collected: 01/04/16 15:15 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.120 ± 0.374 (0.849)** **C:NA T:98%**	pCi/L	01/25/16 19:55	13982-63-3	
Radium-228	EPA 904.0	**0.481 ± 0.382 (0.758)** **C:85% T:76%**	pCi/L	01/27/16 16:52	15262-20-1	2g

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: AMBIENT BLANK **Lab ID: 92281799007** Collected: 01/04/16 17:00 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0592 ± 0.270 (0.550)** **C:NA T:96%**	pCi/L	01/25/16 19:01	13982-63-3	
Radium-228	EPA 904.0	**0.876 ± 0.442 (0.783)** **C:87% T:79%**	pCi/L	01/27/16 16:52	15262-20-1	2g

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Sample: EQUIPMENT BLANK **Lab ID: 92281799008** Collected: 01/04/16 17:30 Received: 01/05/16 12:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.132 ± 0.301 (0.710) C:NA T:88%**	pCi/L	01/25/16 19:08	13982-63-3	
Radium-228	EPA 904.0	**0.491 ± 0.388 (0.766) C:85% T:72%**	pCi/L	01/27/16 16:52	15262-20-1	2g

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: RADC/27593 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 1010908 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.298 ± 0.352 (0.553) C:NA T:100%	pCi/L	01/25/16 18:09	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

QC Batch: RADC/27590 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92281799001, 92281799002, 92281799003, 92281799004, 92281799005, 92281799006, 92281799007, 92281799008

METHOD BLANK: 1010905 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.363 ± 0.421 (0.887) C:91% T:64%	pCi/L	01/27/16 16:51	1g

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

WORKORDER QUALIFIERS

WO: 92281799

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

SAMPLE QUALIFIERS

Sample: 92281799001

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

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QUALIFIERS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

SAMPLE QUALIFIERS

Sample: 92281799002
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.
Sample: 92281799003
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.
Sample: 92281799004
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.
Sample: 92281799005
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.
Sample: 92281799006
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.
Sample: 92281799007
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.
Sample: 92281799008
[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

ANALYTE QUALIFIERS

1g	This result was obtained after re-ingrowthing and re-analyzing the Method Blank. The initial results was elevated due to the presence of radon daughters.
2g	This result was obtained after re-ingrowthing and re-analyzing this sample and the associated Method Blank. The initial analysis results were elevated due to the presence of radon daughters caused by a ventilation issue.
C9	Common Laboratory Contaminant.
D6	The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92281799001	**SW-2**	EPA 300.0	GWD/2797		
92281799002	**SW-1**	EPA 300.0	GWD/2797		
92281799003	**BG-1**	EPA 300.0	GWD/2797		
92281799004	**MW-5**	EPA 300.0	GWD/2797		
92281799005	**LEACHATE-1**	EPA 300.0	GWD/2797		
92281799006	**MW-4**	EPA 300.0	GWD/2797		
92281799007	**AMBIENT BLANK**	EPA 300.0	GWD/2797		
92281799008	**EQUIPMENT BLANK**	EPA 300.0	GWD/2797		
92281799001	**SW-2**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799002	**SW-1**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799003	**BG-1**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799004	**MW-5**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799005	**LEACHATE-1**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799006	**MW-4**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799007	**AMBIENT BLANK**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799008	**EQUIPMENT BLANK**	EPA 3010A	MPRP/20423	EPA 6010	ICP/18427
92281799001	**SW-2**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799002	**SW-1**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799003	**BG-1**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799004	**MW-5**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799005	**LEACHATE-1**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799006	**MW-4**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799007	**AMBIENT BLANK**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799008	**EQUIPMENT BLANK**	EPA 3020	MPRP/60800	EPA 6020A	ICPM/28089
92281799001	**SW-2**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799002	**SW-1**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799003	**BG-1**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799004	**MW-5**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799005	**LEACHATE-1**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799006	**MW-4**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799007	**AMBIENT BLANK**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799008	**EQUIPMENT BLANK**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92281799001	**SW-2**	EPA 8260	MSV/35063		
92281799002	**SW-1**	EPA 8260	MSV/35063		
92281799003	**BG-1**	EPA 8260	MSV/35063		
92281799004	**MW-5**	EPA 8260	MSV/35063		
92281799005	**LEACHATE-1**	EPA 8260	MSV/35063		
92281799006	**MW-4**	EPA 8260	MSV/35063		
92281799007	**AMBIENT BLANK**	EPA 8260	MSV/35063		
92281799008	**EQUIPMENT BLANK**	EPA 8260	MSV/35063		
92281799009	**TRIP BLANK**	EPA 8260	MSV/35063		
92281799001	**SW-2**	EPA 903.1	RADC/27593		
92281799002	**SW-1**	EPA 903.1	RADC/27593		
92281799003	**BG-1**	EPA 903.1	RADC/27593		
92281799004	**MW-5**	EPA 903.1	RADC/27593		
92281799005	**LEACHATE-1**	EPA 903.1	RADC/27593		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92281799

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92281799006	**MW-4**	EPA 903.1	RADC/27593		
92281799007	**AMBIENT BLANK**	EPA 903.1	RADC/27593		
92281799008	**EQUIPMENT BLANK**	EPA 903.1	RADC/27593		
92281799001	**SW-2**	EPA 904.0	RADC/27590		
92281799002	**SW-1**	EPA 904.0	RADC/27590		
92281799003	**BG-1**	EPA 904.0	RADC/27590		
92281799004	**MW-5**	EPA 904.0	RADC/27590		
92281799005	**LEACHATE-1**	EPA 904.0	RADC/27590		
92281799006	**MW-4**	EPA 904.0	RADC/27590		
92281799007	**AMBIENT BLANK**	EPA 904.0	RADC/27590		
92281799008	**EQUIPMENT BLANK**	EPA 904.0	RADC/27590		
92281799001	**SW-2**	SM 2540C	WET/42321		
92281799002	**SW-1**	SM 2540C	WET/42321		
92281799003	**BG-1**	SM 2540C	WET/42321		
92281799004	**MW-5**	SM 2540C	WET/42321		
92281799005	**LEACHATE-1**	SM 2540C	WET/42321		
92281799006	**MW-4**	SM 2540C	WET/42321		
92281799007	**AMBIENT BLANK**	SM 2540C	WET/42321		
92281799008	**EQUIPMENT BLANK**	SM 2540C	WET/42321		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: 26OCT2015 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.17**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO#: 92281799

92281799

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:

Thermometer Used: ☑ T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 1.3 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C **Date and Initials of Person Examining Contents:** AD 1-5-16

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☐ Yes	☑ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☑ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☑ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☑ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☑ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WP	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	
Samples checked for dechlorization	☐ Yes	☐ No	☑ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager SCURF Review: DZ **Date:** 1-5-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers).

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2042727

Section A Required Client Information:

Company: HDR
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name: Cherokee-Brickshaven
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92281794
1	SW-2		G			01/04/16	0455		11									3	2	3	1	1	1		001
2	SW-1						0935		11									3	2	3	1	1	1		002
3	BG-1						1152		11									3	2	3	1	1	1		003
4	MW-5						1325		11									3	2	3	1	1	1		004
5	Leachate-1						1345		11									3	2	3	1	1	1		005
6	MW-4						1515		11									3	2	3	1	1	1		006
7																									
8	Ambient Blank		G			01/04/16	1700		11									3	2	3	1	1	1		007
9	Equipment Blank						1730		11									3	2	3	1	1	1		008
10	Trip Blank								2											2					009
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	01/04/16	1800	[illegible]	~~1-5-16~~ 1-5-16	1230	1.3	✓	N	✓

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 01/04/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

January 28, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 06, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

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cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Charlotte Certification IDs

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92282072001	**MW-6**	Water	01/05/16 10:40	01/06/16 13:50
92282072002	**MW-7**	Water	01/05/16 12:20	01/06/16 13:50
92282072003	**MW-3**	Water	01/05/16 14:40	01/06/16 13:50
92282072004	**AMBIENT BLANK**	Water	01/05/16 15:15	01/06/16 13:50
92282072005	**EQUIP. BLANK**	Water	01/05/16 15:30	01/06/16 13:50
92282072006	**TRIP BLANK**	Water	01/05/16 00:00	01/06/16 13:50

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92282072001	**MW-6**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92282072002	**MW-7**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92282072003	**MW-3**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92282072004	**AMBIENT BLANK**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92282072005	**EQUIP. BLANK**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92282072006	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92282072001	**MW-6**					
EPA 300.0	Chloride	252	mg/L	5.0	01/12/16 13:47	M6
EPA 300.0	Fluoride	0.41	mg/L	0.10	01/12/16 11:11	
EPA 300.0	Sulfate	194	mg/L	5.0	01/12/16 13:47	M6
EPA 6010	Barium	140	ug/L	5.0	01/11/16 16:45	
EPA 6010	Calcium	35600	ug/L	100	01/11/16 16:45	
EPA 6010	Molybdenum	5.4	ug/L	5.0	01/11/16 16:45	
EPA 6010	Thallium	6.2	ug/L	5.4	01/11/16 16:45	
EPA 6010	Zinc	11.3	ug/L	10.0	01/11/16 16:45	
EPA 6020	Boron	8.9	ug/L	5.0	01/11/16 15:19	
EPA 6020	Lithium	55.8	ug/L	0.50	01/11/16 15:19	
EPA 903.1	Radium-226	0.910 ± 0.637 (0.768) C:NA T:86%	pCi/L		01/27/16 17:35	
EPA 904.0	Radium-228	0.555 ± 0.363 (0.689) C:84% T:82%	pCi/L		01/27/16 12:46	
SM 2540C	Total Dissolved Solids	946	mg/L	50.0	01/07/16 19:57	
92282072002	**MW-7**					
EPA 300.0	Chloride	403	mg/L	9.0	01/12/16 15:58	
EPA 300.0	Fluoride	0.35	mg/L	0.10	01/12/16 12:18	
EPA 300.0	Sulfate	32.1	mg/L	1.0	01/12/16 12:18	
EPA 6010	Barium	269	ug/L	5.0	01/11/16 17:04	
EPA 6010	Calcium	45100	ug/L	100	01/11/16 17:04	
EPA 6010	Molybdenum	6.4	ug/L	5.0	01/11/16 17:04	
EPA 6010	Thallium	8.0	ug/L	5.4	01/11/16 17:04	
EPA 6020	Boron	48.3	ug/L	5.0	01/11/16 15:11	
EPA 6020	Lithium	21.7	ug/L	0.50	01/11/16 15:11	
EPA 903.1	Radium-226	0.349 ± 0.565 (0.983) C:NA T:91%	pCi/L		01/27/16 17:35	
EPA 904.0	Radium-228	0.243 ± 0.325 (0.693) C:86% T:82%	pCi/L		01/27/16 12:46	
SM 2540C	Total Dissolved Solids	1120	mg/L	250	01/07/16 19:57	
92282072003	**MW-3**					
EPA 300.0	Chloride	1270	mg/L	25.0	01/12/16 16:27	
EPA 300.0	Fluoride	0.26	mg/L	0.10	01/12/16 12:40	
EPA 300.0	Sulfate	10	mg/L	1.0	01/12/16 12:40	
EPA 6010	Antimony	9.2	ug/L	5.0	01/11/16 17:07	
EPA 6010	Barium	802	ug/L	5.0	01/11/16 17:07	
EPA 6010	Calcium	188000	ug/L	1000	01/12/16 13:21	
EPA 6010	Molybdenum	10.9	ug/L	5.0	01/11/16 17:07	
EPA 6020	Boron	42.0	ug/L	5.0	01/11/16 15:14	

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92282072003	**MW-3**					
EPA 6020	Lithium	65.4	ug/L	0.50	01/11/16 15:14	
EPA 903.1	Radium-226	0.213 ± 0.462 (0.852) C:NA T:94%	pCi/L		01/27/16 17:35	
EPA 904.0	Radium-228	2.09 ± 0.605 (0.732) C:88% T:84%	pCi/L		01/27/16 12:47	
SM 2540C	Total Dissolved Solids	2490	mg/L	250	01/07/16 19:58	
92282072004	**AMBIENT BLANK**					
EPA 903.1	Radium-226	0.168 ± 0.509 (0.913) C:NA T:89%	pCi/L		01/27/16 17:47	
EPA 904.0	Radium-228	0.401 ± 0.328 (0.652) C:87% T:84%	pCi/L		01/27/16 12:47	
92282072005	**EQUIP. BLANK**					
EPA 903.1	Radium-226	0.219 ± 0.430 (0.786) C:NA T:90%	pCi/L		01/27/16 17:47	
EPA 904.0	Radium-228	0.277 ± 0.340 (0.719) C:84% T:82%	pCi/L		01/27/16 16:51	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-6 **Lab ID: 92282072001** Collected: 01/05/16 10:40 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**252**	mg/L	5.0	5		01/12/16 13:47	16887-00-6	M6
Fluoride	**0.41**	mg/L	0.10	1		01/12/16 11:11	16984-48-8	
Sulfate	**194**	mg/L	5.0	5		01/12/16 13:47	14808-79-8	M6
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 16:45	7440-38-2	
Barium	**140**	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 16:45	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 16:45	7440-43-9	
Calcium	**35600**	ug/L	100	1	01/08/16 18:00	01/11/16 16:45	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7439-92-1	
Molybdenum	**5.4**	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 16:45	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-22-4	
Thallium	**6.2**	ug/L	5.4	1	01/08/16 18:00	01/11/16 16:45	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 16:45	7440-62-2	
Zinc	**11.3**	ug/L	10.0	1	01/08/16 18:00	01/11/16 16:45	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**8.9**	ug/L	5.0	1	01/11/16 09:02	01/11/16 15:19	7440-42-8	
Lithium	**55.8**	ug/L	0.50	1	01/11/16 09:02	01/11/16 15:19	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:16	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 12:25	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 12:25	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 12:25	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 12:25	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 12:25	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 12:25	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 12:25	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 12:25	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 12:25	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 12:25	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 12:25	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 12:25	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 12:25	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 12:25	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 12:25	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-6 **Lab ID: 92282072001** Collected: 01/05/16 10:40 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 12:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 12:25	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 12:25	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 12:25	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 12:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 12:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 12:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 12:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 12:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 12:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 12:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 12:25	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 12:25	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 12:25	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 12:25	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 12:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 12:25	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 12:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 12:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 12:25	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 12:25	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 12:25	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 12:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 12:25	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 12:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 12:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 12:25	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 12:25	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 12:25	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 12:25	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		01/11/16 12:25	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/11/16 12:25	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 12:25	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**946**	mg/L	50.0	1		01/07/16 19:57		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-7 **Lab ID: 92282072002** Collected: 01/05/16 12:20 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**403**	mg/L	9.0	9		01/12/16 15:58	16887-00-6	
Fluoride	**0.35**	mg/L	0.10	1		01/12/16 12:18	16984-48-8	
Sulfate	**32.1**	mg/L	1.0	1		01/12/16 12:18	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:04	7440-38-2	
Barium	**269**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:04	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:04	7440-43-9	
Calcium	**45100**	ug/L	100	1	01/08/16 18:00	01/11/16 17:04	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7439-92-1	
Molybdenum	**6.4**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:04	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-22-4	
Thallium	**8.0**	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:04	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:04	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:04	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**48.3**	ug/L	5.0	1	01/11/16 09:02	01/11/16 15:11	7440-42-8	
Lithium	**21.7**	ug/L	0.50	1	01/11/16 09:02	01/11/16 15:11	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:18	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 12:42	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 12:42	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 12:42	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 12:42	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 12:42	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 12:42	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 12:42	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 12:42	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 12:42	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 12:42	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 12:42	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 12:42	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 12:42	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 12:42	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 12:42	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-7 **Lab ID: 92282072002** Collected: 01/05/16 12:20 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 12:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 12:42	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 12:42	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 12:42	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 12:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 12:42	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 12:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 12:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 12:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 12:42	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 12:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 12:42	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 12:42	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 12:42	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 12:42	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 12:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 12:42	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 12:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 12:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 12:42	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 12:42	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 12:42	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 12:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 12:42	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 12:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 12:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 12:42	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 12:42	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 12:42	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 12:42	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		01/11/16 12:42	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		01/11/16 12:42	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		01/11/16 12:42	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1120**	mg/L	250	1		01/07/16 19:57		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-3 **Lab ID: 92282072003** Collected: 01/05/16 14:40 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1270**	mg/L	25.0	25		01/12/16 16:27	16887-00-6	
Fluoride	**0.26**	mg/L	0.10	1		01/12/16 12:40	16984-48-8	
Sulfate	**10**	mg/L	1.0	1		01/12/16 12:40	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**9.2**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:07	7440-38-2	
Barium	**802**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:07	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:07	7440-43-9	
Calcium	**188000**	ug/L	1000	10	01/08/16 18:00	01/12/16 13:21	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7439-92-1	
Molybdenum	**10.9**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:07	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:07	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:07	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:07	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	**42.0**	ug/L	5.0	1	01/11/16 09:02	01/11/16 15:14	7440-42-8	
Lithium	**65.4**	ug/L	0.50	1	01/11/16 09:02	01/11/16 15:14	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:20	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 13:16	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 13:16	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 13:16	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 13:16	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 13:16	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 13:16	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 13:16	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 13:16	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 13:16	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 13:16	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 13:16	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 13:16	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 13:16	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 13:16	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 13:16	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-3 **Lab ID: 92282072003** Collected: 01/05/16 14:40 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 13:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 13:16	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 13:16	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 13:16	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 13:16	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 13:16	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:16	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 13:16	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 13:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 13:16	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 13:16	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 13:16	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 13:16	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 13:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 13:16	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 13:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 13:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 13:16	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 13:16	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 13:16	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 13:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 13:16	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 13:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 13:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 13:16	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 13:16	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 13:16	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 13:16	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		01/11/16 13:16	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		01/11/16 13:16	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		01/11/16 13:16	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2490**	mg/L	250	1		01/07/16 19:58		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: AMBIENT BLANK **Lab ID: 92282072004** Collected: 01/05/16 15:15 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/12/16 13:03	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/12/16 13:03	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/12/16 13:03	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:11	7440-38-2	
Barium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:11	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:11	7440-43-9	
Calcium	ND	ug/L	100	1	01/08/16 18:00	01/11/16 17:11	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:11	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:11	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:11	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:11	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/11/16 09:02	01/11/16 15:17	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/11/16 09:02	01/11/16 15:17	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:23	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 13:33	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 13:33	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 13:33	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 13:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 13:33	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 13:33	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 13:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 13:33	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 13:33	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 13:33	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 13:33	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 13:33	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 13:33	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 13:33	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 13:33	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: AMBIENT BLANK **Lab ID: 92282072004** Collected: 01/05/16 15:15 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 13:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 13:33	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 13:33	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 13:33	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 13:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 13:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 13:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 13:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 13:33	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 13:33	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 13:33	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 13:33	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 13:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 13:33	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 13:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 13:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 13:33	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 13:33	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 13:33	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 13:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 13:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 13:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 13:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 13:33	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 13:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 13:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 13:33	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		01/11/16 13:33	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		01/11/16 13:33	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		01/11/16 13:33	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/07/16 19:58		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: EQUIP. BLANK **Lab ID: 92282072005** Collected: 01/05/16 15:30 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/12/16 13:25	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/12/16 13:25	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/12/16 13:25	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:14	7440-38-2	
Barium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:14	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:14	7440-43-9	
Calcium	ND	ug/L	100	1	01/08/16 18:00	01/11/16 17:14	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:14	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:14	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:14	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:14	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/11/16 09:02	01/11/16 14:43	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/11/16 09:02	01/11/16 14:43	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 18:00	01/11/16 16:25	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 13:50	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 13:50	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 13:50	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 13:50	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 13:50	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 13:50	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 13:50	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 13:50	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 13:50	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 13:50	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 13:50	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 13:50	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 13:50	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 13:50	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 13:50	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: EQUIP. BLANK **Lab ID: 92282072005** Collected: 01/05/16 15:30 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 13:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 13:50	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 13:50	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 13:50	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 13:50	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 13:50	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 13:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 13:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 13:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 13:50	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 13:50	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 13:50	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 13:50	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 13:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 13:50	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 13:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 13:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 13:50	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 13:50	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 13:50	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 13:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 13:50	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 13:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 13:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 13:50	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 13:50	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 13:50	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 13:50	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		01/11/16 13:50	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		01/11/16 13:50	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/11/16 13:50	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/07/16 19:58		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: TRIP BLANK **Lab ID: 92282072006** Collected: 01/05/16 00:00 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 14:08	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 14:08	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 14:08	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 14:08	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 14:08	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 14:08	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 14:08	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 14:08	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 14:08	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 14:08	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 14:08	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 14:08	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 14:08	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 14:08	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 14:08	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/11/16 14:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:08	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:08	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 14:08	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:08	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 14:08	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:08	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 14:08	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 14:08	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 14:08	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 14:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 14:08	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 14:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:08	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 14:08	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 14:08	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:08	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 14:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 14:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 14:08	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 14:08	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 14:08	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 14:08	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		01/11/16 14:08	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: TRIP BLANK **Lab ID: 92282072006** Collected: 01/05/16 00:00 Received: 01/06/16 13:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		01/11/16 14:08	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 14:08	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: GWD/2799 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 1644989 — Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/12/16 10:26	
Fluoride	mg/L	ND	0.10	01/12/16 10:26	
Sulfate	mg/L	ND	1.0	01/12/16 10:26	

LABORATORY CONTROL SAMPLE: 1644990

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.3	101	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	50	48.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1644991 — 1644992

Parameter	Units	92282072001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	252	50	50	302	287	100	69	90-110	5	20	M6
Fluoride	mg/L	0.41	2.5	2.5	2.9	2.9	99	98	90-110	1	20	
Sulfate	mg/L	194	50	50	243	231	98	75	90-110	5	20	M6

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: MERP/8849 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 1643385 Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	01/11/16 15:40	

LABORATORY CONTROL SAMPLE: 1643386

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1643387 1643388

Parameter	Units	92281799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.5	2.4	97	94	75-125	3	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: MPRP/20439 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 1643941 | Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/11/16 16:39	
Arsenic	ug/L	ND	10.0	01/11/16 16:39	
Barium	ug/L	ND	5.0	01/11/16 16:39	
Beryllium	ug/L	ND	1.0	01/11/16 16:39	
Cadmium	ug/L	ND	1.0	01/11/16 16:39	
Calcium	ug/L	ND	100	01/11/16 16:39	
Chromium	ug/L	ND	5.0	01/11/16 16:39	
Cobalt	ug/L	ND	5.0	01/11/16 16:39	
Copper	ug/L	ND	5.0	01/11/16 16:39	
Lead	ug/L	ND	5.0	01/11/16 16:39	
Molybdenum	ug/L	ND	5.0	01/11/16 16:39	
Nickel	ug/L	ND	5.0	01/11/16 16:39	
Selenium	ug/L	ND	10.0	01/11/16 16:39	
Silver	ug/L	ND	5.0	01/11/16 16:39	
Thallium	ug/L	ND	5.4	01/11/16 16:39	
Vanadium	ug/L	ND	5.0	01/11/16 16:39	
Zinc	ug/L	ND	10.0	01/11/16 16:39	

LABORATORY CONTROL SAMPLE: 1643942

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	496	99	80-120	
Arsenic	ug/L	500	466	93	80-120	
Barium	ug/L	500	457	91	80-120	
Beryllium	ug/L	500	452	90	80-120	
Cadmium	ug/L	500	467	93	80-120	
Calcium	ug/L	5000	4760	95	80-120	
Chromium	ug/L	500	454	91	80-120	
Cobalt	ug/L	500	473	95	80-120	
Copper	ug/L	500	463	93	80-120	
Lead	ug/L	500	467	93	80-120	
Molybdenum	ug/L	500	507	101	80-120	
Nickel	ug/L	500	468	94	80-120	
Selenium	ug/L	500	467	93	80-120	
Silver	ug/L	250	236	94	80-120	
Thallium	ug/L	500	450	90	80-120	
Vanadium	ug/L	500	458	92	80-120	
Zinc	ug/L	500	467	93	80-120	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1643943 1643944

Parameter	Units	92282072001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	520	521	103	104	75-125	0	25	
Arsenic	ug/L	ND	500	500	498	497	99	99	75-125	0	25	
Barium	ug/L	140	500	500	623	617	97	95	75-125	1	25	
Beryllium	ug/L	ND	500	500	482	478	96	96	75-125	1	25	
Cadmium	ug/L	ND	500	500	490	491	98	98	75-125	0	25	
Calcium	ug/L	35600	5000	5000	41500	40900	118	107	75-125	1	25	
Chromium	ug/L	ND	500	500	477	477	95	95	75-125	0	25	
Cobalt	ug/L	ND	500	500	480	481	96	96	75-125	0	25	
Copper	ug/L	ND	500	500	494	492	99	98	75-125	0	25	
Lead	ug/L	ND	500	500	464	465	93	93	75-125	0	25	
Molybdenum	ug/L	5.4	500	500	539	545	107	108	75-125	1	25	
Nickel	ug/L	ND	500	500	476	477	95	95	75-125	0	25	
Selenium	ug/L	ND	500	500	490	491	98	98	75-125	0	25	
Silver	ug/L	ND	250	250	250	250	100	100	75-125	0	25	
Thallium	ug/L	6.2	500	500	438	450	86	89	75-125	3	25	
Vanadium	ug/L	ND	500	500	492	493	98	99	75-125	0	25	
Zinc	ug/L	11.3	500	500	497	497	97	97	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: MPRP/60857 Analysis Method: EPA 6020
QC Batch Method: EPA 3020 Analysis Description: 6020 MET
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 2172406 Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	01/11/16 15:06	
Lithium	ug/L	ND	0.50	01/11/16 15:06	

LABORATORY CONTROL SAMPLE: 2172407

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	89.0	111	80-120	
Lithium	ug/L	80	90.7	113	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2172408 2172409

Parameter	Units	92282072001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	8.9	80	80	96.2	95.0	109	108	80-120	1	20	
Lithium	ug/L	55.8	80	80	145	147	111	114	80-120	2	20	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: MSV/35118 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005, 92282072006

METHOD BLANK: 1644486 Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005, 92282072006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1-Dichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1-Dichloroethene	ug/L	ND	1.0	01/11/16 10:59	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/11/16 10:59	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/11/16 10:59	
1,2-Dichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,2-Dichloropropane	ug/L	ND	1.0	01/11/16 10:59	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/11/16 10:59	
2-Butanone (MEK)	ug/L	ND	5.0	01/11/16 10:59	
2-Hexanone	ug/L	ND	5.0	01/11/16 10:59	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/11/16 10:59	
Acetone	ug/L	ND	25.0	01/11/16 10:59	
Acrylonitrile	ug/L	ND	10.0	01/11/16 10:59	
Benzene	ug/L	ND	1.0	01/11/16 10:59	
Bromochloromethane	ug/L	ND	1.0	01/11/16 10:59	
Bromodichloromethane	ug/L	ND	1.0	01/11/16 10:59	
Bromoform	ug/L	ND	1.0	01/11/16 10:59	
Bromomethane	ug/L	ND	2.0	01/11/16 10:59	
Carbon disulfide	ug/L	ND	2.0	01/11/16 10:59	
Carbon tetrachloride	ug/L	ND	1.0	01/11/16 10:59	
Chlorobenzene	ug/L	ND	1.0	01/11/16 10:59	
Chloroethane	ug/L	ND	1.0	01/11/16 10:59	
Chloroform	ug/L	ND	1.0	01/11/16 10:59	
Chloromethane	ug/L	ND	1.0	01/11/16 10:59	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/11/16 10:59	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/11/16 10:59	
Dibromochloromethane	ug/L	ND	1.0	01/11/16 10:59	
Dibromomethane	ug/L	ND	1.0	01/11/16 10:59	
Ethylbenzene	ug/L	ND	1.0	01/11/16 10:59	
Iodomethane	ug/L	ND	5.0	01/11/16 10:59	
Methylene Chloride	ug/L	ND	1.0	01/11/16 10:59	
Styrene	ug/L	ND	1.0	01/11/16 10:59	
Tetrachloroethene	ug/L	ND	1.0	01/11/16 10:59	
Toluene	ug/L	ND	1.0	01/11/16 10:59	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/11/16 10:59	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/11/16 10:59	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/11/16 10:59	
Trichloroethene	ug/L	ND	1.0	01/11/16 10:59	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

METHOD BLANK: 1644486 Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005, 92282072006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/11/16 10:59	
Vinyl acetate	ug/L	ND	2.0	01/11/16 10:59	
Vinyl chloride	ug/L	ND	1.0	01/11/16 10:59	
Xylene (Total)	ug/L	ND	2.0	01/11/16 10:59	
1,2-Dichloroethane-d4 (S)	%	98	70-130	01/11/16 10:59	
4-Bromofluorobenzene (S)	%	105	70-130	01/11/16 10:59	
Toluene-d8 (S)	%	100	70-130	01/11/16 10:59	

LABORATORY CONTROL SAMPLE: 1644487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.1	100	80-125	
1,1,1-Trichloroethane	ug/L	50	49.4	99	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.9	104	79-124	
1,1,2-Trichloroethane	ug/L	50	48.7	97	85-125	
1,1-Dichloroethane	ug/L	50	49.5	99	73-126	
1,1-Dichloroethene	ug/L	50	49.0	98	66-135	
1,2,3-Trichloropropane	ug/L	50	50.9	102	75-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	80-133	
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	45.4	91	75-132	
1,4-Dichlorobenzene	ug/L	50	50.7	101	78-130	
2-Butanone (MEK)	ug/L	100	97.0	97	61-144	
2-Hexanone	ug/L	100	102	102	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.0	99	72-135	
Acetone	ug/L	100	107	107	48-146	
Acrylonitrile	ug/L	250	246	99	40-160	
Benzene	ug/L	50	48.9	98	80-125	
Bromochloromethane	ug/L	50	50.6	101	71-125	
Bromodichloromethane	ug/L	50	50.0	100	78-124	
Bromoform	ug/L	50	45.0	90	71-128	
Bromomethane	ug/L	50	42.5	85	40-160	
Carbon disulfide	ug/L	50	55.4	111	50-160	
Carbon tetrachloride	ug/L	50	51.0	102	69-131	
Chlorobenzene	ug/L	50	50.4	101	81-122	
Chloroethane	ug/L	50	42.7	85	39-148	
Chloroform	ug/L	50	48.6	97	73-127	
Chloromethane	ug/L	50	44.8	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.8	96	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.3	101	72-132	
Dibromochloromethane	ug/L	50	52.6	105	78-125	
Dibromomethane	ug/L	50	50.2	100	82-120	
Ethylbenzene	ug/L	50	49.5	99	79-121	
Iodomethane	ug/L	100	76.3	76	39-154	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

LABORATORY CONTROL SAMPLE: 1644487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	44.4	89	64-133	
Styrene	ug/L	50	51.1	102	84-126	
Tetrachloroethene	ug/L	50	51.5	103	78-122	
Toluene	ug/L	50	48.8	98	80-121	
trans-1,2-Dichloroethene	ug/L	50	47.5	95	71-127	
trans-1,3-Dichloropropene	ug/L	50	50.5	101	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	50.6	101	40-160	
Trichloroethene	ug/L	50	49.3	99	78-122	
Trichlorofluoromethane	ug/L	50	48.8	98	53-137	
Vinyl acetate	ug/L	100	100	100	40-160	
Vinyl chloride	ug/L	50	50.6	101	58-137	
Xylene (Total)	ug/L	150	149	99	81-126	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			110	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1644488

Parameter	Units	92282072001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.3	107	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	24.6	123	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.4	107	70-130	
1,1-Dichloroethane	ug/L	ND	20	23.0	115	70-130	
1,1-Dichloroethene	ug/L	ND	20	23.0	115	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.9	110	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.3	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.3	102	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	22.1	111	70-130	
2-Butanone (MEK)	ug/L	ND	40	44.1	110	70-130	
2-Hexanone	ug/L	ND	40	46.0	115	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	46.9	117	70-130	
Acetone	ug/L	ND	40	50.1	125	70-130	
Acrylonitrile	ug/L	ND	100	112	112	70-130	
Benzene	ug/L	ND	20	21.6	108	70-148	
Bromochloromethane	ug/L	ND	20	22.6	113	70-130	
Bromodichloromethane	ug/L	ND	20	22.3	111	70-130	
Bromoform	ug/L	ND	20	20.1	101	70-130	
Bromomethane	ug/L	ND	20	19.8	99	70-130	
Carbon disulfide	ug/L	ND	20	21.1	105	70-130	
Carbon tetrachloride	ug/L	ND	20	25.8	129	70-130	
Chlorobenzene	ug/L	ND	20	22.2	111	70-146	
Chloroethane	ug/L	ND	20	20.8	104	70-130	
Chloroform	ug/L	ND	20	22.0	110	70-130	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

MATRIX SPIKE SAMPLE: 1644488

Parameter	Units	92282072001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	22.7	113	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	22.0	110	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.6	103	70-130	
Dibromochloromethane	ug/L	ND	20	21.1	105	70-130	
Dibromomethane	ug/L	ND	20	22.7	114	70-130	
Ethylbenzene	ug/L	ND	20	21.6	108	70-130	
Iodomethane	ug/L	ND	40	26.5	66	70-130	M1
Methylene Chloride	ug/L	ND	20	22.5	113	70-130	
Styrene	ug/L	ND	20	21.9	109	70-130	
Tetrachloroethene	ug/L	ND	20	22.2	111	70-130	
Toluene	ug/L	ND	20	21.4	107	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.5	112	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	21.2	106	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	19.4	97	70-130	
Trichloroethene	ug/L	ND	20	22.4	112	69-151	
Trichlorofluoromethane	ug/L	ND	20	24.4	122	70-130	
Vinyl acetate	ug/L	ND	40	40.1	100	70-130	
Vinyl chloride	ug/L	ND	20	22.6	113	70-130	
1,2-Dichloroethane-d4 (S)	%				108	70-130	
4-Bromofluorobenzene (S)	%				108	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1644489

Parameter	Units	92282072002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

SAMPLE DUPLICATE: 1644489

Parameter	Units	92282072002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	104	103	1		
4-Bromofluorobenzene (S)	%	106	109	3		
Toluene-d8 (S)	%	99	101	1		

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: WET/42357 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 1643261 Matrix: Water
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/07/16 19:55	

LABORATORY CONTROL SAMPLE: 1643262

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	254	102	90-110	

SAMPLE DUPLICATE: 1643263

Parameter	Units	92281875001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3010	2520	18	5	D6

SAMPLE DUPLICATE: 1643264

Parameter	Units	92281884001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	327	347	6	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-6 **Lab ID: 92282072001** Collected: 01/05/16 10:40 Received: 01/06/16 13:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.910 ± 0.637 (0.768)** **C:NA T:86%**	pCi/L	01/27/16 17:35	13982-63-3	
Radium-228	EPA 904.0	**0.555 ± 0.363 (0.689)** **C:84% T:82%**	pCi/L	01/27/16 12:46	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-7 **Lab ID: 92282072002** Collected: 01/05/16 12:20 Received: 01/06/16 13:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.349 ± 0.565 (0.983)** **C:NA T:91%**	pCi/L	01/27/16 17:35	13982-63-3	
Radium-228	EPA 904.0	**0.243 ± 0.325 (0.693)** **C:86% T:82%**	pCi/L	01/27/16 12:46	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: MW-3 **Lab ID: 92282072003** Collected: 01/05/16 14:40 Received: 01/06/16 13:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.213 ± 0.462 (0.852)** **C:NA T:94%**	pCi/L	01/27/16 17:35	13982-63-3	
Radium-228	EPA 904.0	**2.09 ± 0.605 (0.732)** **C:88% T:84%**	pCi/L	01/27/16 12:47	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: AMBIENT BLANK **Lab ID: 92282072004** Collected: 01/05/16 15:15 Received: 01/06/16 13:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.168 ± 0.509 (0.913) C:NA T:89%**	pCi/L	01/27/16 17:47	13982-63-3	
Radium-228	EPA 904.0	**0.401 ± 0.328 (0.652) C:87% T:84%**	pCi/L	01/27/16 12:47	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Sample: EQUIP. BLANK **Lab ID: 92282072005** Collected: 01/05/16 15:30 Received: 01/06/16 13:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.219 ± 0.430 (0.786)** **C:NA T:90%**	pCi/L	01/27/16 17:47	13982-63-3	
Radium-228	EPA 904.0	**0.277 ± 0.340 (0.719)** **C:84% T:82%**	pCi/L	01/27/16 16:51	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: RADC/27603 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 1010918 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0936 ± 0.319 (0.721) C:83% T:80%	pCi/L	01/27/16 12:45	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

QC Batch: RADC/27599 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92282072001, 92282072002, 92282072003, 92282072004, 92282072005

METHOD BLANK: 1010914 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.236 ± 0.360 (0.578) C:NA T:94%	pCi/L	01/27/16 17:47	

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QUALIFIERS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

SAMPLE QUALIFIERS

Sample: 92282072001

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

Sample: 92282072002

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

Sample: 92282072003

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

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QUALIFIERS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

SAMPLE QUALIFIERS

Sample: 92282072004

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

Sample: 92282072005

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

ANALYTE QUALIFIERS

D6 The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282072

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92282072001	**MW-6**	EPA 300.0	GWD/2799		
92282072002	**MW-7**	EPA 300.0	GWD/2799		
92282072003	**MW-3**	EPA 300.0	GWD/2799		
92282072004	**AMBIENT BLANK**	EPA 300.0	GWD/2799		
92282072005	**EQUIP. BLANK**	EPA 300.0	GWD/2799		
92282072001	**MW-6**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282072002	**MW-7**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282072003	**MW-3**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282072004	**AMBIENT BLANK**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282072005	**EQUIP. BLANK**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282072001	**MW-6**	EPA 3020	MPRP/60857	EPA 6020	ICPM/28105
92282072002	**MW-7**	EPA 3020	MPRP/60857	EPA 6020	ICPM/28105
92282072003	**MW-3**	EPA 3020	MPRP/60857	EPA 6020	ICPM/28105
92282072004	**AMBIENT BLANK**	EPA 3020	MPRP/60857	EPA 6020	ICPM/28105
92282072005	**EQUIP. BLANK**	EPA 3020	MPRP/60857	EPA 6020	ICPM/28105
92282072001	**MW-6**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92282072002	**MW-7**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92282072003	**MW-3**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92282072004	**AMBIENT BLANK**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92282072005	**EQUIP. BLANK**	EPA 7470	MERP/8849	EPA 7470	MERC/8501
92282072001	**MW-6**	EPA 8260	MSV/35118		
92282072002	**MW-7**	EPA 8260	MSV/35118		
92282072003	**MW-3**	EPA 8260	MSV/35118		
92282072004	**AMBIENT BLANK**	EPA 8260	MSV/35118		
92282072005	**EQUIP. BLANK**	EPA 8260	MSV/35118		
92282072006	**TRIP BLANK**	EPA 8260	MSV/35118		
92282072001	**MW-6**	EPA 903.1	RADC/27599		
92282072002	**MW-7**	EPA 903.1	RADC/27599		
92282072003	**MW-3**	EPA 903.1	RADC/27599		
92282072004	**AMBIENT BLANK**	EPA 903.1	RADC/27599		
92282072005	**EQUIP. BLANK**	EPA 903.1	RADC/27599		
92282072001	**MW-6**	EPA 904.0	RADC/27603		
92282072002	**MW-7**	EPA 904.0	RADC/27603		
92282072003	**MW-3**	EPA 904.0	RADC/27603		
92282072004	**AMBIENT BLANK**	EPA 904.0	RADC/27603		
92282072005	**EQUIP. BLANK**	EPA 904.0	RADC/27603		
92282072001	**MW-6**	SM 2540C	WET/42357		
92282072002	**MW-7**	SM 2540C	WET/42357		
92282072003	**MW-3**	SM 2540C	WET/42357		
92282072004	**AMBIENT BLANK**	SM 2540C	WET/42357		
92282072005	**EQUIP. BLANK**	SM 2540C	WET/42357		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: 26OCT2015 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.17**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO# : 92282072

92282072

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☑ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:

Thermometer Used: ☑ T1505

Type of Ice: ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 4.5

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

USDA Regulated Soil (☑ N/A, water sample)

Date and Initials of Person Examining Contents: 1-6-16 KW

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☐ No	☑ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☐ No	☑ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	
Samples checked for dechlorization	☑ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Person Contacted: Date/Time:

Field Data Required? ☐ Yes ☐ No

Comments/Resolution:

Project Manager SCURF Review: **Date:** 1-7-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Offi hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of
2042730

Section A Required Client Information:
Company: HDR
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:
Report To:
Copy To:
Purchase Order No.:
Project Name: Chapman - Brickhaven
Project Number:

Section C Invoice Information:
Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	Metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-6		G			01/05/16	1040		11									3	2	3	1	1	1		001
2	MW-7						1220		1									3	2	3	1	1	1		002
3	MW-3						1440											3	2	3	1	1	1		003
4																									
5	Ambient Blank		G			01/05/16	1515		11									3	2	3	1	1	1		004
6	Equip. Blank						1530		1									3	2	3	1	1	1		005
7	Trip Blank								2											2					006
8																									
9																									
10																									
11																									
12																									

92282072

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	01/05/16	1700	[illegible] PACE HVL	1-6-16	1350	45	Y	N	Y
				~~[illegible] PACE HVL~~	1-6-16	1350	45	Y	N	Y
				[illegible] 1-8-16						

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Clint Sorrell
SIGNATURE of SAMPLER: Clint Sorrell
DATE Signed (MM/DD/YY): 01/05/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

January 27, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 07, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Charlotte Certification IDs

South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92282241001	**MW-8**	Water	01/06/16 10:50	01/07/16 08:43
92282241002	**MW-1**	Water	01/06/16 13:40	01/07/16 08:43
92282241003	**MW-2**	Water	01/06/16 17:20	01/07/16 08:43
92282241004	**MW-1 DUP.**	Water	01/06/16 14:15	01/07/16 08:43
92282241005	**AMBIENT BLANK**	Water	01/06/16 17:00	01/07/16 08:43
92282241006	**EQUIP. BLANK**	Water	01/06/16 17:30	01/07/16 08:43
92282241007	**TRIP BLANK**	Water	01/06/16 00:00	01/07/16 08:43

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92282241001	**MW-8**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92282241002	**MW-1**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92282241003	**MW-2**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92282241004	**MW-1 DUP.**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92282241005	**AMBIENT BLANK**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92282241006	**EQUIP. BLANK**	EPA 300.0	EIC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020A	TT3	2	PASI-M
		EPA 7470	SH1	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92282241007	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92282241001	**MW-8**					
EPA 300.0	Chloride	755	mg/L	15.0	01/12/16 03:39	
EPA 300.0	Sulfate	5.5	mg/L	1.0	01/11/16 15:25	
EPA 6010	Antimony	7.6	ug/L	5.0	01/11/16 17:17	
EPA 6010	Barium	1430	ug/L	5.0	01/11/16 17:17	
EPA 6010	Calcium	162000	ug/L	1000	01/12/16 13:25	
EPA 6010	Zinc	18.7	ug/L	10.0	01/11/16 17:17	
EPA 6020A	Boron	9.2	ug/L	5.0	01/11/16 14:19	
EPA 6020A	Lithium	39.6	ug/L	0.50	01/11/16 14:19	
EPA 903.1	Radium-226	0.000 ± 0.358 (0.577) C:NA T:92%	pCi/L		01/26/16 19:02	
EPA 904.0	Radium-228	0.864 ± 0.364 (0.582) C:92% T:86%	pCi/L		01/26/16 12:24	
SM 2540C	Total Dissolved Solids	1410	mg/L	250	01/09/16 11:51	
92282241002	**MW-1**					
EPA 300.0	Chloride	446	mg/L	9.0	01/12/16 04:07	
EPA 300.0	Fluoride	0.14	mg/L	0.10	01/11/16 15:48	
EPA 300.0	Sulfate	11.2	mg/L	1.0	01/11/16 15:48	
EPA 6010	Barium	220	ug/L	5.0	01/11/16 17:20	
EPA 6010	Calcium	108000	ug/L	1000	01/12/16 13:28	
EPA 6010	Vanadium	6.2	ug/L	5.0	01/11/16 17:20	
EPA 6010	Zinc	13.3	ug/L	10.0	01/11/16 17:20	
EPA 6020A	Boron	9.6	ug/L	5.0	01/11/16 14:11	
EPA 6020A	Lithium	30.1	ug/L	0.50	01/11/16 14:11	
EPA 903.1	Radium-226	0.209 ± 0.361 (0.646) C:NA T:92%	pCi/L		01/26/16 20:01	
EPA 904.0	Radium-228	0.455 ± 0.314 (0.604) C:94% T:83%	pCi/L		01/26/16 12:24	
SM 2540C	Total Dissolved Solids	700	mg/L	250	01/09/16 11:52	
92282241003	**MW-2**					
EPA 300.0	Chloride	910	mg/L	20.0	01/12/16 04:35	
EPA 300.0	Fluoride	0.29	mg/L	0.10	01/11/16 16:10	
EPA 300.0	Sulfate	228	mg/L	20.0	01/12/16 04:35	
EPA 6010	Antimony	8.7	ug/L	5.0	01/11/16 17:23	
EPA 6010	Barium	262	ug/L	5.0	01/11/16 17:23	
EPA 6010	Calcium	188000	ug/L	1000	01/12/16 13:31	
EPA 6010	Chromium	15.8	ug/L	5.0	01/11/16 17:23	
EPA 6010	Molybdenum	18.1	ug/L	5.0	01/11/16 17:23	
EPA 6010	Nickel	8.7	ug/L	5.0	01/11/16 17:23	
EPA 6020A	Boron	37.8	ug/L	5.0	01/11/16 14:14	

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92282241003	**MW-2**					
EPA 6020A	Lithium	144	ug/L	0.50	01/11/16 14:14	
EPA 903.1	Radium-226	0.716 ± 0.532 (0.665) C:NA T:89%	pCi/L		01/26/16 19:15	
EPA 904.0	Radium-228	1.69 ± 0.536 (0.720) C:92% T:78%	pCi/L		01/26/16 12:24	
SM 2540C	Total Dissolved Solids	2480	mg/L	250	01/09/16 11:52	
92282241004	**MW-1 DUP.**					
EPA 300.0	Chloride	447	mg/L	9.0	01/12/16 05:04	
EPA 300.0	Fluoride	0.13	mg/L	0.10	01/11/16 16:32	
EPA 300.0	Sulfate	11.0	mg/L	1.0	01/11/16 16:32	
EPA 6010	Barium	228	ug/L	5.0	01/11/16 17:26	
EPA 6010	Calcium	116000	ug/L	1000	01/12/16 13:34	
EPA 6010	Vanadium	6.7	ug/L	5.0	01/11/16 17:26	
EPA 6010	Zinc	13.9	ug/L	10.0	01/11/16 17:26	
EPA 6020A	Boron	9.6	ug/L	5.0	01/11/16 14:17	
EPA 6020A	Lithium	30.7	ug/L	0.50	01/11/16 14:17	
EPA 903.1	Radium-226	0.0716 ± 0.327 (0.194) C:NA T:90%	pCi/L		01/26/16 19:28	
EPA 904.0	Radium-228	0.627 ± 0.323 (0.565) C:92% T:87%	pCi/L		01/26/16 12:24	
SM 2540C	Total Dissolved Solids	950	mg/L	250	01/09/16 11:52	
92282241005	**AMBIENT BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.435 (0.919) C:NA T:94%	pCi/L		01/26/16 19:28	
EPA 904.0	Radium-228	0.119 ± 0.306 (0.682) C:90% T:81%	pCi/L		01/26/16 16:14	
92282241006	**EQUIP. BLANK**					
EPA 903.1	Radium-226	0.545 ± 0.409 (0.211) C:NA T:86%	pCi/L		01/26/16 19:40	
EPA 904.0	Radium-228	0.100 ± 0.285 (0.640) C:91% T:84%	pCi/L		01/26/16 16:14	

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(704)875-9092

SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92282241007	**TRIP BLANK**					
EPA 8260	Methylene Chloride	1.1	ug/L	1.0	01/11/16 16:08	C9

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-8 **Lab ID: 92282241001** Collected: 01/06/16 10:50 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**755**	mg/L	15.0	15		01/12/16 03:39	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 15:25	16984-48-8	
Sulfate	**5.5**	mg/L	1.0	1		01/11/16 15:25	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**7.6**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:17	7440-38-2	
Barium	**1430**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:17	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:17	7440-43-9	
Calcium	**162000**	ug/L	1000	10	01/08/16 18:00	01/12/16 13:25	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:17	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:17	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:17	7440-62-2	
Zinc	**18.7**	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:17	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**9.2**	ug/L	5.0	1	01/11/16 09:00	01/11/16 14:19	7440-42-8	
Lithium	**39.6**	ug/L	0.50	1	01/11/16 09:00	01/11/16 14:19	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 21:30	01/14/16 11:39	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 14:25	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 14:25	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 14:25	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 14:25	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 14:25	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 14:25	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 14:25	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 14:25	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 14:25	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 14:25	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 14:25	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 14:25	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 14:25	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 14:25	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 14:25	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-8 **Lab ID: 92282241001** Collected: 01/06/16 10:50 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 14:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:25	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:25	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 14:25	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 14:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:25	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 14:25	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 14:25	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 14:25	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 14:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 14:25	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 14:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:25	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 14:25	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 14:25	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:25	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 14:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 14:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 14:25	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 14:25	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 14:25	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 14:25	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-130	1		01/11/16 14:25	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		01/11/16 14:25	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 14:25	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1410**	mg/L	250	1		01/09/16 11:51		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-1 **Lab ID: 92282241002** Collected: 01/06/16 13:40 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**446**	mg/L	9.0	9		01/12/16 04:07	16887-00-6	
Fluoride	**0.14**	mg/L	0.10	1		01/11/16 15:48	16984-48-8	
Sulfate	**11.2**	mg/L	1.0	1		01/11/16 15:48	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:20	7440-38-2	
Barium	**220**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:20	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:20	7440-43-9	
Calcium	**108000**	ug/L	1000	10	01/08/16 18:00	01/12/16 13:28	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:20	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:20	7440-28-0	
Vanadium	**6.2**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:20	7440-62-2	
Zinc	**13.3**	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:20	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**9.6**	ug/L	5.0	1	01/11/16 09:00	01/11/16 14:11	7440-42-8	
Lithium	**30.1**	ug/L	0.50	1	01/11/16 09:00	01/11/16 14:11	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 21:30	01/14/16 11:41	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 14:42	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 14:42	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 14:42	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 14:42	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 14:42	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 14:42	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 14:42	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 14:42	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 14:42	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 14:42	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 14:42	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 14:42	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 14:42	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 14:42	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 14:42	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-1 **Lab ID: 92282241002** Collected: 01/06/16 13:40 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 14:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:42	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:42	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 14:42	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:42	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 14:42	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:42	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 14:42	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 14:42	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 14:42	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 14:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 14:42	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 14:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:42	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 14:42	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 14:42	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:42	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 14:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 14:42	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 14:42	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 14:42	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 14:42	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 14:42	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	109	%	70-130	1		01/11/16 14:42	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		01/11/16 14:42	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 14:42	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**700**	mg/L	250	1		01/09/16 11:52		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-2 **Lab ID: 92282241003** Collected: 01/06/16 17:20 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**910**	mg/L	20.0	20		01/12/16 04:35	16887-00-6	
Fluoride	**0.29**	mg/L	0.10	1		01/11/16 16:10	16984-48-8	
Sulfate	**228**	mg/L	20.0	20		01/12/16 04:35	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**8.7**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:23	7440-38-2	
Barium	**262**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:23	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:23	7440-43-9	
Calcium	**188000**	ug/L	1000	10	01/08/16 18:00	01/12/16 13:31	7440-70-2	
Chromium	**15.8**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7439-92-1	
Molybdenum	**18.1**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7439-98-7	
Nickel	**8.7**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:23	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:23	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:23	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:23	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**37.8**	ug/L	5.0	1	01/11/16 09:00	01/11/16 14:14	7440-42-8	
Lithium	**144**	ug/L	0.50	1	01/11/16 09:00	01/11/16 14:14	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 21:30	01/14/16 11:43	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 14:59	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 14:59	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 14:59	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 14:59	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 14:59	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 14:59	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 14:59	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 14:59	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 14:59	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 14:59	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 14:59	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 14:59	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 14:59	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 14:59	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 14:59	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-2 **Lab ID: 92282241003** Collected: 01/06/16 17:20 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 14:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:59	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 14:59	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 14:59	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:59	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 14:59	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 14:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 14:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 14:59	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 14:59	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 14:59	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 14:59	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 14:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 14:59	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 14:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 14:59	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 14:59	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 14:59	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 14:59	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 14:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 14:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 14:59	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 14:59	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 14:59	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 14:59	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	109	%	70-130	1		01/11/16 14:59	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		01/11/16 14:59	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 14:59	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2480**	mg/L	250	1		01/09/16 11:52		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-1 DUP. **Lab ID: 92282241004** Collected: 01/06/16 14:15 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**447**	mg/L	9.0	9		01/12/16 05:04	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		01/11/16 16:32	16984-48-8	
Sulfate	**11.0**	mg/L	1.0	1		01/11/16 16:32	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:26	7440-38-2	
Barium	**228**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:26	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:26	7440-43-9	
Calcium	**116000**	ug/L	1000	10	01/08/16 18:00	01/12/16 13:34	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:26	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/11/16 17:26	7440-28-0	
Vanadium	**6.7**	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:26	7440-62-2	
Zinc	**13.9**	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:26	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	**9.6**	ug/L	5.0	1	01/11/16 09:00	01/11/16 14:17	7440-42-8	
Lithium	**30.7**	ug/L	0.50	1	01/11/16 09:00	01/11/16 14:17	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 21:30	01/14/16 11:46	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 15:16	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 15:16	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 15:16	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 15:16	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 15:16	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 15:16	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 15:16	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 15:16	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 15:16	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 15:16	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 15:16	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 15:16	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 15:16	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 15:16	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 15:16	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-1 DUP. **Lab ID: 92282241004** Collected: 01/06/16 14:15 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 15:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 15:16	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 15:16	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 15:16	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 15:16	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 15:16	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:16	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 15:16	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 15:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 15:16	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 15:16	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 15:16	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 15:16	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 15:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 15:16	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 15:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 15:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 15:16	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 15:16	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 15:16	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 15:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 15:16	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 15:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 15:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 15:16	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 15:16	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 15:16	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 15:16	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	111	%	70-130	1		01/11/16 15:16	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	70-130	1		01/11/16 15:16	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/11/16 15:16	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**950**	mg/L	250	1		01/09/16 11:52		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: AMBIENT BLANK **Lab ID: 92282241005** Collected: 01/06/16 17:00 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/11/16 16:55	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 16:55	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/11/16 16:55	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:39	7440-38-2	
Barium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:39	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:39	7440-43-9	
Calcium	ND	ug/L	100	1	01/08/16 18:00	01/11/16 17:39	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:39	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/12/16 13:46	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:39	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:39	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/11/16 09:00	01/11/16 14:38	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/11/16 09:00	01/11/16 14:38	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 21:30	01/14/16 11:48	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 15:33	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 15:33	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 15:33	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 15:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 15:33	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 15:33	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 15:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 15:33	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 15:33	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 15:33	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 15:33	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 15:33	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 15:33	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 15:33	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 15:33	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: AMBIENT BLANK **Lab ID: 92282241005** Collected: 01/06/16 17:00 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 15:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 15:33	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 15:33	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 15:33	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 15:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 15:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 15:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 15:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 15:33	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 15:33	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 15:33	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 15:33	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 15:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 15:33	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 15:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 15:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 15:33	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 15:33	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 15:33	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 15:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 15:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 15:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 15:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 15:33	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 15:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 15:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 15:33	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	109	%	70-130	1		01/11/16 15:33	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130	1		01/11/16 15:33	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 15:33	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/09/16 11:52		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: EQUIP. BLANK **Lab ID: 92282241006** Collected: 01/06/16 17:30 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/11/16 17:17	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/11/16 17:17	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/11/16 17:17	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:42	7440-38-2	
Barium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:42	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/08/16 18:00	01/11/16 17:42	7440-43-9	
Calcium	ND	ug/L	100	1	01/08/16 18:00	01/11/16 17:42	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-48-4	
Copper	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-50-8	
Lead	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:42	7782-49-2	
Silver	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-22-4	
Thallium	ND	ug/L	5.4	1	01/08/16 18:00	01/12/16 13:50	7440-28-0	
Vanadium	ND	ug/L	5.0	1	01/08/16 18:00	01/11/16 17:42	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/08/16 18:00	01/11/16 17:42	7440-66-6	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/11/16 09:00	01/11/16 14:41	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/11/16 09:00	01/11/16 14:41	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/08/16 21:30	01/14/16 11:50	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 15:50	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 15:50	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 15:50	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 15:50	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 15:50	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 15:50	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 15:50	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 15:50	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 15:50	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 15:50	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 15:50	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 15:50	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 15:50	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 15:50	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 15:50	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: EQUIP. BLANK **Lab ID: 92282241006** Collected: 01/06/16 17:30 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		01/11/16 15:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 15:50	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 15:50	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 15:50	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 15:50	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 15:50	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 15:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 15:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 15:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 15:50	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 15:50	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 15:50	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 15:50	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/11/16 15:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 15:50	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 15:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 15:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 15:50	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 15:50	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 15:50	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 15:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 15:50	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 15:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 15:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 15:50	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 15:50	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 15:50	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 15:50	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		01/11/16 15:50	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130	1		01/11/16 15:50	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		01/11/16 15:50	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/09/16 11:52		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: TRIP BLANK **Lab ID: 92282241007** Collected: 01/06/16 00:00 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/11/16 16:08	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/11/16 16:08	107-13-1	
Benzene	ND	ug/L	1.0	1		01/11/16 16:08	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/11/16 16:08	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/11/16 16:08	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/11/16 16:08	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/11/16 16:08	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/11/16 16:08	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/11/16 16:08	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/11/16 16:08	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/11/16 16:08	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/11/16 16:08	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/11/16 16:08	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/11/16 16:08	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/11/16 16:08	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/11/16 16:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 16:08	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/11/16 16:08	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/11/16 16:08	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/11/16 16:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/11/16 16:08	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/11/16 16:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 16:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/11/16 16:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/11/16 16:08	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 16:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/11/16 16:08	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/11/16 16:08	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/11/16 16:08	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/11/16 16:08	74-88-4	
Methylene Chloride	**1.1**	ug/L	1.0	1		01/11/16 16:08	75-09-2	C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/11/16 16:08	108-10-1	
Styrene	ND	ug/L	1.0	1		01/11/16 16:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 16:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/11/16 16:08	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/11/16 16:08	127-18-4	
Toluene	ND	ug/L	1.0	1		01/11/16 16:08	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/11/16 16:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/11/16 16:08	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/11/16 16:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/11/16 16:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/11/16 16:08	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/11/16 16:08	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/11/16 16:08	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		01/11/16 16:08	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	109	%	70-130	1		01/11/16 16:08	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: TRIP BLANK **Lab ID: 92282241007** Collected: 01/06/16 00:00 Received: 01/07/16 08:43 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	109	%	70-130	1		01/11/16 16:08	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		01/11/16 16:08	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: GWD/2797 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 1644433 Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/11/16 09:49	
Fluoride	mg/L	ND	0.10	01/11/16 09:49	
Sulfate	mg/L	ND	1.0	01/11/16 09:49	

LABORATORY CONTROL SAMPLE: 1644434

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.0	98	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	50	48.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1644435 1644436

Parameter	Units	92281799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.7	50	50	57.2	58.2	101	103	90-110	2	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.5	96	97	90-110	1	20	
Sulfate	mg/L	9.4	50	50	59.9	60.6	101	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1644437 1644438

Parameter	Units	92282212001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	64.1	50	50	114	116	100	103	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	98	102	90-110	4	20	
Sulfate	mg/L	46.9	50	50	96.4	99.7	99	106	90-110	3	20	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: MERP/8850 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 1643395 Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	01/14/16 11:10	

LABORATORY CONTROL SAMPLE: 1643396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1643397 1643398

Parameter	Units	92281698007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.4	92	93	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: MPRP/20439 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 1643941 | Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/11/16 16:39	
Arsenic	ug/L	ND	10.0	01/11/16 16:39	
Barium	ug/L	ND	5.0	01/11/16 16:39	
Beryllium	ug/L	ND	1.0	01/11/16 16:39	
Cadmium	ug/L	ND	1.0	01/11/16 16:39	
Calcium	ug/L	ND	100	01/11/16 16:39	
Chromium	ug/L	ND	5.0	01/11/16 16:39	
Cobalt	ug/L	ND	5.0	01/11/16 16:39	
Copper	ug/L	ND	5.0	01/11/16 16:39	
Lead	ug/L	ND	5.0	01/11/16 16:39	
Molybdenum	ug/L	ND	5.0	01/11/16 16:39	
Nickel	ug/L	ND	5.0	01/11/16 16:39	
Selenium	ug/L	ND	10.0	01/11/16 16:39	
Silver	ug/L	ND	5.0	01/11/16 16:39	
Thallium	ug/L	ND	5.4	01/11/16 16:39	
Vanadium	ug/L	ND	5.0	01/11/16 16:39	
Zinc	ug/L	ND	10.0	01/11/16 16:39	

LABORATORY CONTROL SAMPLE: 1643942

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	496	99	80-120	
Arsenic	ug/L	500	466	93	80-120	
Barium	ug/L	500	457	91	80-120	
Beryllium	ug/L	500	452	90	80-120	
Cadmium	ug/L	500	467	93	80-120	
Calcium	ug/L	5000	4760	95	80-120	
Chromium	ug/L	500	454	91	80-120	
Cobalt	ug/L	500	473	95	80-120	
Copper	ug/L	500	463	93	80-120	
Lead	ug/L	500	467	93	80-120	
Molybdenum	ug/L	500	507	101	80-120	
Nickel	ug/L	500	468	94	80-120	
Selenium	ug/L	500	467	93	80-120	
Silver	ug/L	250	236	94	80-120	
Thallium	ug/L	500	450	90	80-120	
Vanadium	ug/L	500	458	92	80-120	
Zinc	ug/L	500	467	93	80-120	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1643943 1643944

Parameter	Units	92282072001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	520	521	103	104	75-125	0	25	
Arsenic	ug/L	ND	500	500	498	497	99	99	75-125	0	25	
Barium	ug/L	140	500	500	623	617	97	95	75-125	1	25	
Beryllium	ug/L	ND	500	500	482	478	96	96	75-125	1	25	
Cadmium	ug/L	ND	500	500	490	491	98	98	75-125	0	25	
Calcium	ug/L	35600	5000	5000	41500	40900	118	107	75-125	1	25	
Chromium	ug/L	ND	500	500	477	477	95	95	75-125	0	25	
Cobalt	ug/L	ND	500	500	480	481	96	96	75-125	0	25	
Copper	ug/L	ND	500	500	494	492	99	98	75-125	0	25	
Lead	ug/L	ND	500	500	464	465	93	93	75-125	0	25	
Molybdenum	ug/L	5.4	500	500	539	545	107	108	75-125	1	25	
Nickel	ug/L	ND	500	500	476	477	95	95	75-125	0	25	
Selenium	ug/L	ND	500	500	490	491	98	98	75-125	0	25	
Silver	ug/L	ND	250	250	250	250	100	100	75-125	0	25	
Thallium	ug/L	6.2	500	500	438	450	86	89	75-125	3	25	
Vanadium	ug/L	ND	500	500	492	493	98	99	75-125	0	25	
Zinc	ug/L	11.3	500	500	497	497	97	97	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: MPRP/60875 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 2172925 Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	01/11/16 14:06	
Lithium	ug/L	ND	0.50	01/11/16 14:06	

LABORATORY CONTROL SAMPLE: 2172926

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	90.5	113	80-120	
Lithium	ug/L	80	91.0	114	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2172927 2172928

Parameter	Units	92282241001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	9.2	80	80	101	99.6	115	113	80-120	2	20	
Lithium	ug/L	39.6	80	80	131	131	114	114	80-120	0	20	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: MSV/35118 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006, 92282241007

METHOD BLANK: 1644486 Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006, 92282241007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1-Dichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,1-Dichloroethene	ug/L	ND	1.0	01/11/16 10:59	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/11/16 10:59	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/11/16 10:59	
1,2-Dichloroethane	ug/L	ND	1.0	01/11/16 10:59	
1,2-Dichloropropane	ug/L	ND	1.0	01/11/16 10:59	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/11/16 10:59	
2-Butanone (MEK)	ug/L	ND	5.0	01/11/16 10:59	
2-Hexanone	ug/L	ND	5.0	01/11/16 10:59	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/11/16 10:59	
Acetone	ug/L	ND	25.0	01/11/16 10:59	
Acrylonitrile	ug/L	ND	10.0	01/11/16 10:59	
Benzene	ug/L	ND	1.0	01/11/16 10:59	
Bromochloromethane	ug/L	ND	1.0	01/11/16 10:59	
Bromodichloromethane	ug/L	ND	1.0	01/11/16 10:59	
Bromoform	ug/L	ND	1.0	01/11/16 10:59	
Bromomethane	ug/L	ND	2.0	01/11/16 10:59	
Carbon disulfide	ug/L	ND	2.0	01/11/16 10:59	
Carbon tetrachloride	ug/L	ND	1.0	01/11/16 10:59	
Chlorobenzene	ug/L	ND	1.0	01/11/16 10:59	
Chloroethane	ug/L	ND	1.0	01/11/16 10:59	
Chloroform	ug/L	ND	1.0	01/11/16 10:59	
Chloromethane	ug/L	ND	1.0	01/11/16 10:59	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/11/16 10:59	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/11/16 10:59	
Dibromochloromethane	ug/L	ND	1.0	01/11/16 10:59	
Dibromomethane	ug/L	ND	1.0	01/11/16 10:59	
Ethylbenzene	ug/L	ND	1.0	01/11/16 10:59	
Iodomethane	ug/L	ND	5.0	01/11/16 10:59	
Methylene Chloride	ug/L	ND	1.0	01/11/16 10:59	
Styrene	ug/L	ND	1.0	01/11/16 10:59	
Tetrachloroethene	ug/L	ND	1.0	01/11/16 10:59	
Toluene	ug/L	ND	1.0	01/11/16 10:59	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/11/16 10:59	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/11/16 10:59	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/11/16 10:59	
Trichloroethene	ug/L	ND	1.0	01/11/16 10:59	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

METHOD BLANK: 1644486 Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006, 92282241007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/11/16 10:59	
Vinyl acetate	ug/L	ND	2.0	01/11/16 10:59	
Vinyl chloride	ug/L	ND	1.0	01/11/16 10:59	
Xylene (Total)	ug/L	ND	2.0	01/11/16 10:59	
1,2-Dichloroethane-d4 (S)	%	98	70-130	01/11/16 10:59	
4-Bromofluorobenzene (S)	%	105	70-130	01/11/16 10:59	
Toluene-d8 (S)	%	100	70-130	01/11/16 10:59	

LABORATORY CONTROL SAMPLE: 1644487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.1	100	80-125	
1,1,1-Trichloroethane	ug/L	50	49.4	99	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.9	104	79-124	
1,1,2-Trichloroethane	ug/L	50	48.7	97	85-125	
1,1-Dichloroethane	ug/L	50	49.5	99	73-126	
1,1-Dichloroethene	ug/L	50	49.0	98	66-135	
1,2,3-Trichloropropane	ug/L	50	50.9	102	75-130	
1,2-Dichlorobenzene	ug/L	50	49.5	99	80-133	
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	45.4	91	75-132	
1,4-Dichlorobenzene	ug/L	50	50.7	101	78-130	
2-Butanone (MEK)	ug/L	100	97.0	97	61-144	
2-Hexanone	ug/L	100	102	102	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	99.0	99	72-135	
Acetone	ug/L	100	107	107	48-146	
Acrylonitrile	ug/L	250	246	99	40-160	
Benzene	ug/L	50	48.9	98	80-125	
Bromochloromethane	ug/L	50	50.6	101	71-125	
Bromodichloromethane	ug/L	50	50.0	100	78-124	
Bromoform	ug/L	50	45.0	90	71-128	
Bromomethane	ug/L	50	42.5	85	40-160	
Carbon disulfide	ug/L	50	55.4	111	50-160	
Carbon tetrachloride	ug/L	50	51.0	102	69-131	
Chlorobenzene	ug/L	50	50.4	101	81-122	
Chloroethane	ug/L	50	42.7	85	39-148	
Chloroform	ug/L	50	48.6	97	73-127	
Chloromethane	ug/L	50	44.8	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.8	96	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.3	101	72-132	
Dibromochloromethane	ug/L	50	52.6	105	78-125	
Dibromomethane	ug/L	50	50.2	100	82-120	
Ethylbenzene	ug/L	50	49.5	99	79-121	
Iodomethane	ug/L	100	76.3	76	39-154	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

LABORATORY CONTROL SAMPLE: 1644487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	44.4	89	64-133	
Styrene	ug/L	50	51.1	102	84-126	
Tetrachloroethene	ug/L	50	51.5	103	78-122	
Toluene	ug/L	50	48.8	98	80-121	
trans-1,2-Dichloroethene	ug/L	50	47.5	95	71-127	
trans-1,3-Dichloropropene	ug/L	50	50.5	101	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	50.6	101	40-160	
Trichloroethene	ug/L	50	49.3	99	78-122	
Trichlorofluoromethane	ug/L	50	48.8	98	53-137	
Vinyl acetate	ug/L	100	100	100	40-160	
Vinyl chloride	ug/L	50	50.6	101	58-137	
Xylene (Total)	ug/L	150	149	99	81-126	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			110	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1644488

Parameter	Units	92282072001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.3	107	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	24.6	123	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.4	107	70-130	
1,1-Dichloroethane	ug/L	ND	20	23.0	115	70-130	
1,1-Dichloroethene	ug/L	ND	20	23.0	115	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.9	110	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.3	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.3	102	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	22.1	111	70-130	
2-Butanone (MEK)	ug/L	ND	40	44.1	110	70-130	
2-Hexanone	ug/L	ND	40	46.0	115	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	46.9	117	70-130	
Acetone	ug/L	ND	40	50.1	125	70-130	
Acrylonitrile	ug/L	ND	100	112	112	70-130	
Benzene	ug/L	ND	20	21.6	108	70-148	
Bromochloromethane	ug/L	ND	20	22.6	113	70-130	
Bromodichloromethane	ug/L	ND	20	22.3	111	70-130	
Bromoform	ug/L	ND	20	20.1	101	70-130	
Bromomethane	ug/L	ND	20	19.8	99	70-130	
Carbon disulfide	ug/L	ND	20	21.1	105	70-130	
Carbon tetrachloride	ug/L	ND	20	25.8	129	70-130	
Chlorobenzene	ug/L	ND	20	22.2	111	70-146	
Chloroethane	ug/L	ND	20	20.8	104	70-130	
Chloroform	ug/L	ND	20	22.0	110	70-130	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

MATRIX SPIKE SAMPLE: 1644488

Parameter	Units	92282072001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	22.7	113	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	22.0	110	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.6	103	70-130	
Dibromochloromethane	ug/L	ND	20	21.1	105	70-130	
Dibromomethane	ug/L	ND	20	22.7	114	70-130	
Ethylbenzene	ug/L	ND	20	21.6	108	70-130	
Iodomethane	ug/L	ND	40	26.5	66	70-130	M1
Methylene Chloride	ug/L	ND	20	22.5	113	70-130	
Styrene	ug/L	ND	20	21.9	109	70-130	
Tetrachloroethene	ug/L	ND	20	22.2	111	70-130	
Toluene	ug/L	ND	20	21.4	107	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.5	112	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	21.2	106	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	19.4	97	70-130	
Trichloroethene	ug/L	ND	20	22.4	112	69-151	
Trichlorofluoromethane	ug/L	ND	20	24.4	122	70-130	
Vinyl acetate	ug/L	ND	40	40.1	100	70-130	
Vinyl chloride	ug/L	ND	20	22.6	113	70-130	
1,2-Dichloroethane-d4 (S)	%				108	70-130	
4-Bromofluorobenzene (S)	%				108	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1644489

Parameter	Units	92282072002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

SAMPLE DUPLICATE: 1644489

Parameter	Units	92282072002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	104	103	1		
4-Bromofluorobenzene (S)	%	106	109	3		
Toluene-d8 (S)	%	99	101	1		

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: WET/42388 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 1644309 Matrix: Water
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/09/16 11:49	

LABORATORY CONTROL SAMPLE: 1644310

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	256	102	90-110	

SAMPLE DUPLICATE: 1644311

Parameter	Units	92282363003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	340	339	0	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-8 **Lab ID: 92282241001** Collected: 01/06/16 10:50 Received: 01/07/16 08:43 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.358 (0.577)** **C:NA T:92%**	pCi/L	01/26/16 19:02	13982-63-3	
Radium-228	EPA 904.0	**0.864 ± 0.364 (0.582)** **C:92% T:86%**	pCi/L	01/26/16 12:24	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-1 **Lab ID: 92282241002** Collected: 01/06/16 13:40 Received: 01/07/16 08:43 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.209 ± 0.361 (0.646)** **C:NA T:92%**	pCi/L	01/26/16 20:01	13982-63-3	
Radium-228	EPA 904.0	**0.455 ± 0.314 (0.604)** **C:94% T:83%**	pCi/L	01/26/16 12:24	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-2 **Lab ID: 92282241003** Collected: 01/06/16 17:20 Received: 01/07/16 08:43 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.716 ± 0.532 (0.665)** **C:NA T:89%**	pCi/L	01/26/16 19:15	13982-63-3	
Radium-228	EPA 904.0	**1.69 ± 0.536 (0.720)** **C:92% T:78%**	pCi/L	01/26/16 12:24	15262-20-1	

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: MW-1 DUP. **Lab ID: 92282241004** Collected: 01/06/16 14:15 Received: 01/07/16 08:43 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0716 ± 0.327 (0.194)** **C:NA T:90%**	pCi/L	01/26/16 19:28	13982-63-3	
Radium-228	EPA 904.0	**0.627 ± 0.323 (0.565)** **C:92% T:87%**	pCi/L	01/26/16 12:24	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: AMBIENT BLANK **Lab ID: 92282241005** Collected: 01/06/16 17:00 Received: 01/07/16 08:43 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.435 (0.919)** **C:NA T:94%**	pCi/L	01/26/16 19:28	13982-63-3	
Radium-228	EPA 904.0	**0.119 ± 0.306 (0.682)** **C:90% T:81%**	pCi/L	01/26/16 16:14	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Sample: EQUIP. BLANK **Lab ID: 92282241006** Collected: 01/06/16 17:30 Received: 01/07/16 08:43 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.545 ± 0.409 (0.211)** **C:NA T:86%**	pCi/L	01/26/16 19:40	13982-63-3	
Radium-228	EPA 904.0	**0.100 ± 0.285 (0.640)** **C:91% T:84%**	pCi/L	01/26/16 16:14	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: RADC/27660 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 1013930 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0721 ± 0.329 (0.670) C:NA T:92%	pCi/L	01/26/16 18:26	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

QC Batch: RADC/27621 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92282241001, 92282241002, 92282241003, 92282241004, 92282241005, 92282241006

METHOD BLANK: 1012925 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.749 ± 0.351 (0.590) C:89% T:85%	pCi/L	01/26/16 12:25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

WORKORDER QUALIFIERS

WO: 92282241

[1] The analysis for Lithium and Boron was performed per EPA 6020 B criteria to meet North Carolina method requirements.

ANALYTE QUALIFIERS

C9 Common Laboratory Contaminant.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92282241001	**MW-8**	EPA 300.0	GWD/2797		
92282241002	**MW-1**	EPA 300.0	GWD/2797		
92282241003	**MW-2**	EPA 300.0	GWD/2797		
92282241004	**MW-1 DUP.**	EPA 300.0	GWD/2797		
92282241005	**AMBIENT BLANK**	EPA 300.0	GWD/2797		
92282241006	**EQUIP. BLANK**	EPA 300.0	GWD/2797		
92282241001	**MW-8**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282241002	**MW-1**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282241003	**MW-2**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282241004	**MW-1 DUP.**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282241005	**AMBIENT BLANK**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282241006	**EQUIP. BLANK**	EPA 3010A	MPRP/20439	EPA 6010	ICP/18443
92282241001	**MW-8**	EPA 3020	MPRP/60875	EPA 6020A	ICPM/28104
92282241002	**MW-1**	EPA 3020	MPRP/60875	EPA 6020A	ICPM/28104
92282241003	**MW-2**	EPA 3020	MPRP/60875	EPA 6020A	ICPM/28104
92282241004	**MW-1 DUP.**	EPA 3020	MPRP/60875	EPA 6020A	ICPM/28104
92282241005	**AMBIENT BLANK**	EPA 3020	MPRP/60875	EPA 6020A	ICPM/28104
92282241006	**EQUIP. BLANK**	EPA 3020	MPRP/60875	EPA 6020A	ICPM/28104
92282241001	**MW-8**	EPA 7470	MERP/8850	EPA 7470	MERC/8499
92282241002	**MW-1**	EPA 7470	MERP/8850	EPA 7470	MERC/8499
92282241003	**MW-2**	EPA 7470	MERP/8850	EPA 7470	MERC/8499
92282241004	**MW-1 DUP.**	EPA 7470	MERP/8850	EPA 7470	MERC/8499
92282241005	**AMBIENT BLANK**	EPA 7470	MERP/8850	EPA 7470	MERC/8499
92282241006	**EQUIP. BLANK**	EPA 7470	MERP/8850	EPA 7470	MERC/8499
92282241001	**MW-8**	EPA 8260	MSV/35118		
92282241002	**MW-1**	EPA 8260	MSV/35118		
92282241003	**MW-2**	EPA 8260	MSV/35118		
92282241004	**MW-1 DUP.**	EPA 8260	MSV/35118		
92282241005	**AMBIENT BLANK**	EPA 8260	MSV/35118		
92282241006	**EQUIP. BLANK**	EPA 8260	MSV/35118		
92282241007	**TRIP BLANK**	EPA 8260	MSV/35118		
92282241001	**MW-8**	EPA 903.1	RADC/27660		
92282241002	**MW-1**	EPA 903.1	RADC/27660		
92282241003	**MW-2**	EPA 903.1	RADC/27660		
92282241004	**MW-1 DUP.**	EPA 903.1	RADC/27660		
92282241005	**AMBIENT BLANK**	EPA 903.1	RADC/27660		
92282241006	**EQUIP. BLANK**	EPA 903.1	RADC/27660		
92282241001	**MW-8**	EPA 904.0	RADC/27621		
92282241002	**MW-1**	EPA 904.0	RADC/27621		
92282241003	**MW-2**	EPA 904.0	RADC/27621		
92282241004	**MW-1 DUP.**	EPA 904.0	RADC/27621		
92282241005	**AMBIENT BLANK**	EPA 904.0	RADC/27621		
92282241006	**EQUIP. BLANK**	EPA 904.0	RADC/27621		
92282241001	**MW-8**	SM 2540C	WET/42388		
92282241002	**MW-1**	SM 2540C	WET/42388		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92282241

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92282241003	**MW-2**	SM 2540C	WET/42388		
92282241004	**MW-1 DUP.**	SM 2540C	WET/42388		
92282241005	**AMBIENT BLANK**	SM 2540C	WET/42388		
92282241006	**EQUIP. BLANK**	SM 2540C	WET/42388		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: 26OCT2015 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.17**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: HOR

Project #: WO#: 92282241

92282241

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:

Thermometer Used: ☑ T1505

Type of Ice: ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 3.1

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C **Date and Initials of Person Examining Contents:** 1/7

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☑ N/A	
Samples checked for dechlorization	☑ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☐ N/A	16. HCL TB NO ON COC
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager SCURF Review: SR **Date:** 1-7-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers).

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2042729

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HDR	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Charah - Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- [ ] NPDES
- [x] GROUND WATER
- [ ] DRINKING WATER
- [ ] UST
- [ ] RCRA
- [ ] OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Radium 226/228	metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-8		G			01/06/16	1050		11										3	2	3	1	1	1		001
2	MW-1		↓			↓	1340		11										3	2	3	1	1	1		002
3	MW-2		↓			↓	1720		11										3	2	3	1	1	1		003
4																										
5	MW-1 Dup.		G			01/06/16	1415		11										3	2	3	1	1	1		004
6																										
7	Ambient Blank		G			01/06/16	1700		11										3	2	3	1	1	1		005
8	Equip. Blank		↓			↓	1730		11										3	2	3	1	1	1		006
9																										TB 007
10																										
11																										
12																										

9228 2241

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	01/06/16	1850	S. Lee PACE	1-7-15	0843				
	S. Lee PACE	1-7-15	1255	Omolle Pace HVL	1-7-15	1255	31	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 01/06/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, Inc.
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(704)875-9092

March 09, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on February 17, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92286895001	**BG-1**	Water	02/16/16 09:45	02/17/16 15:05
92286895002	**MW-5**	Water	02/16/16 11:00	02/17/16 15:05
92286895003	**LEACHATE-1**	Water	02/16/16 10:50	02/17/16 15:05
92286895004	**MW-3**	Water	02/16/16 12:45	02/17/16 15:05
92286895005	**MW-4**	Water	02/16/16 16:35	02/17/16 15:05
92286895006	**SW-1**	Water	02/16/16 16:50	02/17/16 15:05
92286895007	**AMBIENT BLANK**	Water	02/16/16 13:45	02/17/16 15:05
92286895008	**EQ. BLANK**	Water	02/16/16 17:00	02/17/16 15:05
92286895009	**TRIP BLANK**	Water	02/16/16 07:30	02/17/16 15:05

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92286895001	**BG-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895002	**MW-5**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895003	**LEACHATE-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895004	**MW-3**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895005	**MW-4**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895006	**SW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895007	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895008	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MDW	1	PASI-A
92286895009	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92286895001	**BG-1**					
EPA 300.0	Chloride	277	mg/L	6.0	02/22/16 22:32	M6
EPA 300.0	Fluoride	0.13	mg/L	0.10	02/22/16 13:24	
EPA 300.0	Sulfate	18.6	mg/L	1.0	02/22/16 13:24	
EPA 6010	Barium	354	ug/L	5.0	02/19/16 22:43	
EPA 6010	Calcium	29500	ug/L	100	02/23/16 16:52	M1
EPA 6010	Molybdenum	6.8	ug/L	5.0	02/19/16 22:43	
EPA 6010	Thallium	13.7	ug/L	5.4	02/19/16 22:43	
EPA 6010	Vanadium	5.1	ug/L	5.0	02/23/16 16:52	
EPA 6020B	Boron	5.5	ug/L	5.0	02/23/16 08:21	
EPA 6020B	Lithium	17.1	ug/L	0.50	02/23/16 08:21	
EPA 903.1	Radium-226	0.553 ± 0.609 (0.974) C:NA T:95%	pCi/L		03/02/16 18:32	1g
EPA 904.0	Radium-228	0.256 ± 0.331 (0.705) C:83% T:86%	pCi/L		03/04/16 11:33	
SM 2540C	Total Dissolved Solids	650	mg/L	50.0	02/18/16 11:13	
92286895002	**MW-5**					
EPA 300.0	Chloride	21.3	mg/L	1.0	02/22/16 14:28	
EPA 300.0	Fluoride	0.55	mg/L	0.10	02/22/16 14:28	
EPA 300.0	Sulfate	3.6	mg/L	1.0	02/22/16 14:28	
EPA 6010	Barium	129	ug/L	5.0	02/19/16 22:52	
EPA 6010	Calcium	16900	ug/L	100	02/23/16 17:13	
EPA 6010	Thallium	14.8	ug/L	5.4	02/19/16 22:52	
EPA 6020B	Boron	10.2	ug/L	5.0	02/23/16 08:34	
EPA 6020B	Lithium	6.3	ug/L	0.50	02/23/16 08:34	
EPA 903.1	Radium-226	-0.142 ± 0.441 (1.00) C:NA T:94%	pCi/L		03/02/16 18:44	1g
EPA 904.0	Radium-228	0.154 ± 0.297 (0.653) C:80% T:94%	pCi/L		03/04/16 15:22	
SM 2540C	Total Dissolved Solids	263	mg/L	25.0	02/18/16 11:13	
92286895003	**LEACHATE-1**					
EPA 300.0	Chloride	7.1	mg/L	1.0	02/22/16 14:49	
EPA 300.0	Fluoride	0.13	mg/L	0.10	02/22/16 14:49	
EPA 300.0	Sulfate	125	mg/L	2.0	02/22/16 23:53	
EPA 6010	Antimony	13.5	ug/L	5.0	02/19/16 22:56	
EPA 6010	Arsenic	25.6	ug/L	10.0	02/19/16 22:56	
EPA 6010	Barium	205	ug/L	5.0	02/19/16 22:56	
EPA 6010	Calcium	65000	ug/L	100	02/23/16 17:16	
EPA 6010	Chromium	66.4	ug/L	5.0	02/19/16 22:56	
EPA 6010	Molybdenum	110	ug/L	5.0	02/23/16 17:16	

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92286895003	**LEACHATE-1**					
EPA 6010	Selenium	388	ug/L	10.0	02/19/16 22:56	
EPA 6010	Vanadium	58.6	ug/L	5.0	02/23/16 17:16	
EPA 6010	Zinc	53.6	ug/L	10.0	02/19/16 22:56	
EPA 6020B	Boron	329	ug/L	25.0	02/23/16 09:49	
EPA 6020B	Lithium	21.7	ug/L	0.50	02/23/16 08:37	
EPA 903.1	Radium-226	0.166 ± 0.400 (0.772) C:NA T:82%	pCi/L		03/02/16 19:08	1g
EPA 904.0	Radium-228	0.372 ± 0.362 (0.745) C:83% T:78%	pCi/L		03/04/16 15:22	
SM 2540C	Total Dissolved Solids	315	mg/L	25.0	02/18/16 11:14	
92286895004	**MW-3**					
EPA 300.0	Chloride	1280	mg/L	25.0	02/23/16 00:21	
EPA 300.0	Fluoride	0.21	mg/L	0.10	02/22/16 15:10	
EPA 300.0	Sulfate	9.1	mg/L	1.0	02/22/16 15:10	
EPA 6010	Antimony	10.8	ug/L	5.0	02/19/16 22:59	
EPA 6010	Barium	855	ug/L	5.0	02/19/16 22:59	
EPA 6010	Calcium	174000	ug/L	1000	02/22/16 17:44	
EPA 6010	Molybdenum	13.8	ug/L	5.0	02/23/16 17:20	
EPA 6020B	Boron	35.8	ug/L	5.0	02/23/16 08:39	
EPA 6020B	Lithium	75.5	ug/L	0.50	02/23/16 08:39	
EPA 903.1	Radium-226	1.18 ± 0.783 (1.00) C:NA T:91%	pCi/L		03/08/16 20:15	
EPA 904.0	Radium-228	1.78 ± 0.527 (0.626) C:83% T:85%	pCi/L		03/04/16 15:22	
SM 2540C	Total Dissolved Solids	2270	mg/L	250	02/18/16 11:14	
92286895005	**MW-4**					
EPA 300.0	Chloride	188	mg/L	5.0	02/23/16 00:48	
EPA 300.0	Fluoride	0.36	mg/L	0.10	02/22/16 15:31	
EPA 300.0	Sulfate	5.6	mg/L	1.0	02/22/16 15:31	
EPA 6010	Antimony	5.0	ug/L	5.0	02/19/16 23:02	
EPA 6010	Barium	157	ug/L	5.0	02/19/16 23:02	
EPA 6010	Calcium	35200	ug/L	100	02/23/16 17:23	
EPA 6020B	Boron	5.7	ug/L	5.0	02/23/16 08:47	
EPA 6020B	Lithium	22.8	ug/L	0.50	02/23/16 08:47	
EPA 903.1	Radium-226	0.0693 ± 0.316 (0.510) C:NA T:100%	pCi/L		03/02/16 19:22	1g

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92286895005	**MW-4**					
EPA 904.0	Radium-228	0.171 ± 0.315 (0.690) C:83% T:88%	pCi/L		03/04/16 15:22	
SM 2540C	Total Dissolved Solids	800	mg/L	50.0	02/18/16 11:15	
92286895006	**SW-1**					
EPA 300.0	Chloride	5.5	mg/L	1.0	02/22/16 15:52	
EPA 300.0	Fluoride	0.12	mg/L	0.10	02/22/16 15:52	
EPA 300.0	Sulfate	5.0	mg/L	1.0	02/22/16 15:52	
EPA 6010	Barium	438	ug/L	5.0	02/19/16 23:05	
EPA 6010	Beryllium	2.1	ug/L	1.0	02/19/16 23:05	
EPA 6010	Calcium	6630	ug/L	100	02/23/16 17:26	
EPA 6010	Chromium	20.4	ug/L	5.0	02/19/16 23:05	
EPA 6010	Cobalt	13.1	ug/L	5.0	02/19/16 23:05	
EPA 6010	Copper	24.5	ug/L	5.0	02/19/16 23:05	
EPA 6010	Lead	37.3	ug/L	5.0	02/19/16 23:05	
EPA 6010	Nickel	16.8	ug/L	5.0	02/19/16 23:05	
EPA 6010	Vanadium	61.3	ug/L	5.0	02/23/16 17:26	
EPA 6010	Zinc	91.1	ug/L	10.0	02/19/16 23:05	
EPA 6020B	Boron	8.6	ug/L	5.0	02/23/16 08:50	
EPA 6020B	Lithium	1.6	ug/L	0.50	02/23/16 08:50	
EPA 903.1	Radium-226	0.454 ± 0.557 (0.908) C:NA T:88%	pCi/L		03/02/16 19:22	1g
EPA 904.0	Radium-228	1.24 ± 0.941 (1.85) C:77% T:70%	pCi/L		03/07/16 16:35	
SM 2540C	Total Dissolved Solids	614	mg/L	25.0	02/18/16 11:16	
92286895007	**AMBIENT BLANK**					
EPA 903.1	Radium-226	-0.274 ± 0.314 (0.822) C:NA T:95%	pCi/L		03/02/16 19:08	1g
EPA 904.0	Radium-228	0.470 ± 0.332 (0.643) C:82% T:89%	pCi/L		03/04/16 15:23	
92286895008	**EQ. BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.348 (0.561) C:NA T:92%	pCi/L		03/02/16 19:34	1g

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92286895008	**EQ. BLANK**					
EPA 904.0	Radium-228	0.405 ± 0.344 (0.692) C:80% T:88%	pCi/L		03/04/16 15:23	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: BG-1 **Lab ID: 92286895001** Collected: 02/16/16 09:45 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**277**	mg/L	6.0	6		02/22/16 22:32	16887-00-6	M6
Fluoride	**0.13**	mg/L	0.10	1		02/22/16 13:24	16984-48-8	
Sulfate	**18.6**	mg/L	1.0	1		02/22/16 13:24	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:43	7440-38-2	
Barium	**354**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:43	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:43	7440-43-9	
Calcium	**29500**	ug/L	100	1	02/18/16 18:30	02/23/16 16:52	7440-70-2	M1
Chromium	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7439-92-1	
Molybdenum	**6.8**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:43	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:43	7440-22-4	
Thallium	**13.7**	ug/L	5.4	1	02/18/16 18:30	02/19/16 22:43	7440-28-0	
Vanadium	**5.1**	ug/L	5.0	1	02/18/16 18:30	02/23/16 16:52	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:43	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**5.5**	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:21	7440-42-8	
Lithium	**17.1**	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:21	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 12:49	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 22:13	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 22:13	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 22:13	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 22:13	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 22:13	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 22:13	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 22:13	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 22:13	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 22:13	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 22:13	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 22:13	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 22:13	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 22:13	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 22:13	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 22:13	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: BG-1 **Lab ID: 92286895001** Collected: 02/16/16 09:45 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 22:13	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 22:13	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 22:13	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 22:13	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 22:13	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 22:13	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 22:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 22:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 22:13	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 22:13	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 22:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 22:13	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 22:13	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 22:13	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 22:13	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 22:13	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 22:13	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 22:13	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 22:13	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 22:13	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 22:13	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 22:13	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 22:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 22:13	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 22:13	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 22:13	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 22:13	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 22:13	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 22:13	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 22:13	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 22:13	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		02/18/16 22:13	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		02/18/16 22:13	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**650**	mg/L	50.0	1		02/18/16 11:13		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-5 **Lab ID: 92286895002** Collected: 02/16/16 11:00 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**21.3**	mg/L	1.0	1		02/22/16 14:28	16887-00-6	
Fluoride	**0.55**	mg/L	0.10	1		02/22/16 14:28	16984-48-8	
Sulfate	**3.6**	mg/L	1.0	1		02/22/16 14:28	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:52	7440-38-2	
Barium	**129**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:52	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:52	7440-43-9	
Calcium	**16900**	ug/L	100	1	02/18/16 18:30	02/23/16 17:13	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:13	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:52	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:52	7440-22-4	
Thallium	**14.8**	ug/L	5.4	1	02/18/16 18:30	02/19/16 22:52	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:13	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:52	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10.2**	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:34	7440-42-8	
Lithium	**6.3**	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:34	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 12:56	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 22:47	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 22:47	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 22:47	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 22:47	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 22:47	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 22:47	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 22:47	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 22:47	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 22:47	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 22:47	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 22:47	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 22:47	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 22:47	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 22:47	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 22:47	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-5 **Lab ID: 92286895002** Collected: 02/16/16 11:00 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 22:47	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 22:47	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 22:47	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 22:47	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 22:47	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 22:47	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 22:47	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 22:47	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 22:47	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 22:47	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 22:47	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 22:47	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 22:47	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 22:47	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 22:47	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 22:47	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 22:47	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 22:47	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 22:47	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 22:47	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 22:47	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 22:47	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 22:47	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 22:47	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 22:47	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 22:47	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 22:47	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 22:47	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 22:47	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 22:47	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 22:47	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		02/18/16 22:47	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		02/18/16 22:47	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**263**	mg/L	25.0	1		02/18/16 11:13		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: LEACHATE-1 **Lab ID: 92286895003** Collected: 02/16/16 10:50 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**7.1**	mg/L	1.0	1		02/22/16 14:49	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		02/22/16 14:49	16984-48-8	
Sulfate	**125**	mg/L	2.0	2		02/22/16 23:53	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**13.5**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-36-0	
Arsenic	**25.6**	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:56	7440-38-2	
Barium	**205**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:56	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:56	7440-43-9	
Calcium	**65000**	ug/L	100	1	02/18/16 18:30	02/23/16 17:16	7440-70-2	
Chromium	**66.4**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7439-92-1	
Molybdenum	**110**	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:16	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-02-0	
Selenium	**388**	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:56	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:56	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/18/16 18:30	02/19/16 22:56	7440-28-0	
Vanadium	**58.6**	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:16	7440-62-2	
Zinc	**53.6**	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:56	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**329**	ug/L	25.0	5	02/22/16 12:38	02/23/16 09:49	7440-42-8	
Lithium	**21.7**	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:37	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 12:58	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 23:04	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 23:04	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 23:04	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 23:04	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 23:04	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 23:04	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 23:04	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 23:04	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 23:04	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 23:04	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 23:04	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 23:04	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 23:04	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 23:04	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 23:04	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: LEACHATE-1 **Lab ID: 92286895003** Collected: 02/16/16 10:50 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 23:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:04	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:04	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 23:04	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:04	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 23:04	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:04	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 23:04	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 23:04	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 23:04	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 23:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 23:04	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 23:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:04	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 23:04	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 23:04	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:04	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 23:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 23:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 23:04	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 23:04	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 23:04	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 23:04	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		02/18/16 23:04	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		02/18/16 23:04	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		02/18/16 23:04	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**315**	mg/L	25.0	1		02/18/16 11:14		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-3 **Lab ID: 92286895004** Collected: 02/16/16 12:45 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1280**	mg/L	25.0	25		02/23/16 00:21	16887-00-6	
Fluoride	**0.21**	mg/L	0.10	1		02/22/16 15:10	16984-48-8	
Sulfate	**9.1**	mg/L	1.0	1		02/22/16 15:10	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**10.8**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:59	7440-38-2	
Barium	**855**	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:59	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 22:59	7440-43-9	
Calcium	**174000**	ug/L	1000	10	02/18/16 18:30	02/22/16 17:44	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7439-92-1	
Molybdenum	**13.8**	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:20	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:59	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 22:59	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/18/16 18:30	02/19/16 22:59	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:20	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 22:59	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**35.8**	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:39	7440-42-8	
Lithium	**75.5**	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:39	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 13:01	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 23:21	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 23:21	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 23:21	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 23:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 23:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 23:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 23:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 23:21	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 23:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 23:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 23:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 23:21	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 23:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 23:21	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 23:21	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-3 **Lab ID: 92286895004** Collected: 02/16/16 12:45 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 23:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 23:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 23:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 23:21	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 23:21	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 23:21	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 23:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 23:21	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 23:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 23:21	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 23:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 23:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 23:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 23:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 23:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 23:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 23:21	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 23:21	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		02/18/16 23:21	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/18/16 23:21	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2270**	mg/L	250	1		02/18/16 11:14		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-4 **Lab ID: 92286895005** Collected: 02/16/16 16:35 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**188**	mg/L	5.0	5		02/23/16 00:48	16887-00-6	
Fluoride	**0.36**	mg/L	0.10	1		02/22/16 15:31	16984-48-8	
Sulfate	**5.6**	mg/L	1.0	1		02/22/16 15:31	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**5.0**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:02	7440-38-2	
Barium	**157**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 23:02	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 23:02	7440-43-9	
Calcium	**35200**	ug/L	100	1	02/18/16 18:30	02/23/16 17:23	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:23	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:02	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:02	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/18/16 18:30	02/19/16 23:02	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:23	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:02	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**5.7**	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:47	7440-42-8	
Lithium	**22.8**	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:47	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 13:03	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 23:38	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 23:38	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 23:38	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 23:38	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 23:38	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 23:38	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 23:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 23:38	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 23:38	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 23:38	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 23:38	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 23:38	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 23:38	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 23:38	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 23:38	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-4 **Lab ID: 92286895005** Collected: 02/16/16 16:35 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 23:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:38	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:38	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 23:38	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 23:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:38	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 23:38	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 23:38	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 23:38	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 23:38	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 23:38	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 23:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:38	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 23:38	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 23:38	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:38	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 23:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 23:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 23:38	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 23:38	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 23:38	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 23:38	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 23:38	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	70-130	1		02/18/16 23:38	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/18/16 23:38	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**800**	mg/L	50.0	1		02/18/16 11:15		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: SW-1 **Lab ID: 92286895006** Collected: 02/16/16 16:50 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**5.5**	mg/L	1.0	1		02/22/16 15:52	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		02/22/16 15:52	16984-48-8	
Sulfate	**5.0**	mg/L	1.0	1		02/22/16 15:52	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:05	7440-38-2	
Barium	**438**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-39-3	
Beryllium	**2.1**	ug/L	1.0	1	02/18/16 18:30	02/19/16 23:05	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 23:05	7440-43-9	
Calcium	**6630**	ug/L	100	1	02/18/16 18:30	02/23/16 17:26	7440-70-2	
Chromium	**20.4**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-47-3	
Cobalt	**13.1**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-48-4	
Copper	**24.5**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-50-8	
Lead	**37.3**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:26	7439-98-7	
Nickel	**16.8**	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:05	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:05	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/18/16 18:30	02/19/16 23:05	7440-28-0	
Vanadium	**61.3**	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:26	7440-62-2	
Zinc	**91.1**	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:05	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**8.6**	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:50	7440-42-8	
Lithium	**1.6**	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:50	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 13:05	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 23:55	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 23:55	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 23:55	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 23:55	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 23:55	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 23:55	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 23:55	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 23:55	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 23:55	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 23:55	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 23:55	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 23:55	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 23:55	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 23:55	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 23:55	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: SW-1 **Lab ID: 92286895006** Collected: 02/16/16 16:50 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 23:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:55	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 23:55	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 23:55	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:55	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 23:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 23:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 23:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 23:55	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 23:55	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 23:55	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 23:55	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 23:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 23:55	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 23:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 23:55	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 23:55	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 23:55	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 23:55	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 23:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 23:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 23:55	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 23:55	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 23:55	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 23:55	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		02/18/16 23:55	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130	1		02/18/16 23:55	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		02/18/16 23:55	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**614**	mg/L	25.0	1		02/18/16 11:16		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: AMBIENT BLANK **Lab ID: 92286895007** Collected: 02/16/16 13:45 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		02/22/16 16:13	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/22/16 16:13	16984-48-8	
Sulfate	ND	mg/L	1.0	1		02/22/16 16:13	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:18	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:18	7440-38-2	
Barium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:29	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/23/16 17:29	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 23:18	7440-43-9	
Calcium	ND	ug/L	100	1	02/18/16 18:30	02/23/16 17:29	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:18	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:18	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:18	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:18	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:29	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:29	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:18	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:18	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/18/16 18:30	02/19/16 23:18	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:29	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:18	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:52	7440-42-8	
Lithium	ND	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:52	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 13:08	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 18:50	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 18:50	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 18:50	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 18:50	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 18:50	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 18:50	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 18:50	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 18:50	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 18:50	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 18:50	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 18:50	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 18:50	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 18:50	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 18:50	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 18:50	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: AMBIENT BLANK **Lab ID: 92286895007** Collected: 02/16/16 13:45 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 18:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 18:50	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 18:50	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 18:50	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 18:50	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 18:50	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 18:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 18:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 18:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 18:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 18:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 18:50	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 18:50	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 18:50	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 18:50	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 18:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 18:50	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 18:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 18:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 18:50	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 18:50	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 18:50	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 18:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 18:50	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 18:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 18:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 18:50	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 18:50	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 18:50	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 18:50	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 18:50	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	70-130	1		02/18/16 18:50	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		02/18/16 18:50	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		02/18/16 11:17		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: EQ. BLANK **Lab ID: 92286895008** Collected: 02/16/16 17:00 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		02/22/16 16:34	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/22/16 16:34	16984-48-8	
Sulfate	ND	mg/L	1.0	1		02/22/16 16:34	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:21	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:21	7440-38-2	
Barium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:32	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/18/16 18:30	02/23/16 17:32	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/18/16 18:30	02/19/16 23:21	7440-43-9	
Calcium	ND	ug/L	100	1	02/18/16 18:30	02/23/16 17:32	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:21	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:21	7440-48-4	
Copper	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:21	7440-50-8	
Lead	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:21	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:32	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:32	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:21	7782-49-2	
Silver	ND	ug/L	5.0	1	02/18/16 18:30	02/19/16 23:21	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/18/16 18:30	02/19/16 23:21	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/18/16 18:30	02/23/16 17:32	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/18/16 18:30	02/19/16 23:21	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	02/22/16 12:38	02/23/16 08:54	7440-42-8	
Lithium	ND	ug/L	0.50	1	02/22/16 12:38	02/23/16 08:54	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/19/16 18:30	02/22/16 13:10	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 19:07	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 19:07	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 19:07	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 19:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 19:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 19:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 19:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 19:07	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 19:07	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 19:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 19:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 19:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 19:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 19:07	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 19:07	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: EQ. BLANK **Lab ID: 92286895008** Collected: 02/16/16 17:00 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/18/16 19:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 19:07	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 19:07	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 19:07	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 19:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 19:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 19:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 19:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 19:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 19:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 19:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 19:07	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 19:07	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 19:07	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 19:07	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 19:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 19:07	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 19:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 19:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 19:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 19:07	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 19:07	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 19:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 19:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 19:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 19:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 19:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 19:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 19:07	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 19:07	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 19:07	460-00-4	
1,2-Dichloroethane-d4 (S)	108	%	70-130	1		02/18/16 19:07	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		02/18/16 19:07	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		02/18/16 11:17		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: TRIP BLANK **Lab ID: 92286895009** Collected: 02/16/16 07:30 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/18/16 18:33	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/18/16 18:33	107-13-1	
Benzene	ND	ug/L	1.0	1		02/18/16 18:33	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/18/16 18:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/18/16 18:33	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/18/16 18:33	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/18/16 18:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/18/16 18:33	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/18/16 18:33	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/18/16 18:33	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/18/16 18:33	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/18/16 18:33	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/18/16 18:33	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/18/16 18:33	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/18/16 18:33	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		02/18/16 18:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 18:33	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/18/16 18:33	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/18/16 18:33	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/18/16 18:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/18/16 18:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/18/16 18:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 18:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/18/16 18:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/18/16 18:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 18:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/18/16 18:33	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/18/16 18:33	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/18/16 18:33	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/18/16 18:33	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/18/16 18:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/18/16 18:33	108-10-1	
Styrene	ND	ug/L	1.0	1		02/18/16 18:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 18:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/18/16 18:33	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/18/16 18:33	127-18-4	
Toluene	ND	ug/L	1.0	1		02/18/16 18:33	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/18/16 18:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/18/16 18:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/18/16 18:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/18/16 18:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/18/16 18:33	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/18/16 18:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/18/16 18:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/18/16 18:33	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		02/18/16 18:33	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: TRIP BLANK **Lab ID: 92286895009** Collected: 02/16/16 07:30 Received: 02/17/16 15:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		02/18/16 18:33	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		02/18/16 18:33	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: GWD/2899 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

METHOD BLANK: 1670717 — Matrix: Water
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/22/16 12:42	
Fluoride	mg/L	ND	0.10	02/22/16 12:42	
Sulfate	mg/L	ND	1.0	02/22/16 12:42	

LABORATORY CONTROL SAMPLE: 1670718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.2	98	90-110	
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	50	48.2	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1670719 1670720

Parameter	Units	92286895001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	277	50	50	254	225	-46	-105	90-110	12	20	M6
Fluoride	mg/L	0.13	2.5	2.5	2.4	2.5	91	94	90-110	3	20	
Sulfate	mg/L	18.6	50	50	67.0	67.6	97	98	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1670721 1670722

Parameter	Units	92286721048 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.3	50	50	50.2	51.9	94	97	90-110	3	20	
Fluoride	mg/L	ND	2.5	2.5	2.3	2.4	87	93	90-110	7	20	M1
Sulfate	mg/L	2.0	50	50	47.6	49.6	91	95	90-110	4	20	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: MERP/8978 — Analysis Method: EPA 7470
QC Batch Method: EPA 7470 — Analysis Description: 7470 Mercury
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

METHOD BLANK: 1669815 — Matrix: Water
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	02/22/16 12:28	

LABORATORY CONTROL SAMPLE: 1669816

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.1	84	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669817 1669818

Parameter	Units	92286775001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.2	2.4	89	94	75-125	6	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: MPRP/20737 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

METHOD BLANK: 1669003 | Matrix: Water
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	02/19/16 22:37	
Arsenic	ug/L	ND	10.0	02/19/16 22:37	
Barium	ug/L	ND	5.0	02/19/16 22:37	
Beryllium	ug/L	ND	1.0	02/19/16 22:37	
Cadmium	ug/L	ND	1.0	02/19/16 22:37	
Calcium	ug/L	ND	100	02/23/16 16:46	
Chromium	ug/L	ND	5.0	02/19/16 22:37	
Cobalt	ug/L	ND	5.0	02/19/16 22:37	
Copper	ug/L	ND	5.0	02/19/16 22:37	
Lead	ug/L	ND	5.0	02/19/16 22:37	
Molybdenum	ug/L	ND	5.0	02/19/16 22:37	
Nickel	ug/L	ND	5.0	02/19/16 22:37	
Selenium	ug/L	ND	10.0	02/19/16 22:37	
Silver	ug/L	ND	5.0	02/19/16 22:37	
Thallium	ug/L	ND	5.4	02/19/16 22:37	
Vanadium	ug/L	ND	5.0	02/23/16 16:46	
Zinc	ug/L	ND	10.0	02/19/16 22:37	

LABORATORY CONTROL SAMPLE: 1669004

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	460	92	80-120	
Arsenic	ug/L	500	487	97	80-120	
Barium	ug/L	500	540	108	80-120	
Beryllium	ug/L	500	537	107	80-120	
Cadmium	ug/L	500	524	105	80-120	
Calcium	ug/L	5000	5320	106	80-120	
Chromium	ug/L	500	522	104	80-120	
Cobalt	ug/L	500	519	104	80-120	
Copper	ug/L	500	528	106	80-120	
Lead	ug/L	500	515	103	80-120	
Molybdenum	ug/L	500	451	90	80-120	
Nickel	ug/L	500	526	105	80-120	
Selenium	ug/L	500	514	103	80-120	
Silver	ug/L	250	226	91	80-120	
Thallium	ug/L	500	475	95	80-120	
Vanadium	ug/L	500	498	100	80-120	
Zinc	ug/L	500	511	102	80-120	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669005 1669006

Parameter	Units	92286895001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	452	465	90	93	75-125	3	25	
Arsenic	ug/L	ND	500	500	490	504	98	101	75-125	3	25	
Barium	ug/L	354	500	500	873	884	104	106	75-125	1	25	
Beryllium	ug/L	ND	500	500	521	539	104	108	75-125	3	25	
Cadmium	ug/L	ND	500	500	509	526	102	105	75-125	3	25	
Calcium	ug/L	29500	5000	5000	35600	36400	121	139	75-125	2	25	M1
Chromium	ug/L	ND	500	500	501	523	100	104	75-125	4	25	
Cobalt	ug/L	ND	500	500	491	506	98	101	75-125	3	25	
Copper	ug/L	ND	500	500	515	535	103	107	75-125	4	25	
Lead	ug/L	ND	500	500	478	494	96	99	75-125	3	25	
Molybdenum	ug/L	6.8	500	500	445	477	88	94	75-125	7	25	
Nickel	ug/L	ND	500	500	494	512	99	102	75-125	4	25	
Selenium	ug/L	ND	500	500	503	519	100	104	75-125	3	25	
Silver	ug/L	ND	250	250	220	228	88	91	75-125	4	25	
Thallium	ug/L	13.7	500	500	434	470	84	91	75-125	8	25	
Vanadium	ug/L	5.1	500	500	502	535	99	106	75-125	6	25	
Zinc	ug/L	ND	500	500	502	516	98	101	75-125	3	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: MPRP/61570 — Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 — Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

METHOD BLANK: 2196289 — Matrix: Water
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/23/16 08:16	
Lithium	ug/L	ND	0.50	02/23/16 08:16	

LABORATORY CONTROL SAMPLE: 2196290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	77.9	97	80-120	
Lithium	ug/L	80	80.6	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2196291 2196292

Parameter	Units	92286895001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	5.5	80	80	71.8	73.5	83	85	75-125	2	20	
Lithium	ug/L	17.1	80	80	91.4	92.6	93	94	75-125	1	20	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: MSV/35624 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008, 92286895009

METHOD BLANK: 1669161 Matrix: Water
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008, 92286895009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	02/18/16 13:45	
1,1,1-Trichloroethane	ug/L	ND	1.0	02/18/16 13:45	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	02/18/16 13:45	
1,1,2-Trichloroethane	ug/L	ND	1.0	02/18/16 13:45	
1,1-Dichloroethane	ug/L	ND	1.0	02/18/16 13:45	
1,1-Dichloroethene	ug/L	ND	1.0	02/18/16 13:45	
1,2,3-Trichloropropane	ug/L	ND	1.0	02/18/16 13:45	
1,2-Dichlorobenzene	ug/L	ND	1.0	02/18/16 13:45	
1,2-Dichloroethane	ug/L	ND	1.0	02/18/16 13:45	
1,2-Dichloropropane	ug/L	ND	1.0	02/18/16 13:45	
1,4-Dichlorobenzene	ug/L	ND	1.0	02/18/16 13:45	
2-Butanone (MEK)	ug/L	ND	5.0	02/18/16 13:45	
2-Hexanone	ug/L	ND	5.0	02/18/16 13:45	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	02/18/16 13:45	
Acetone	ug/L	ND	25.0	02/18/16 13:45	
Acrylonitrile	ug/L	ND	10.0	02/18/16 13:45	
Benzene	ug/L	ND	1.0	02/18/16 13:45	
Bromochloromethane	ug/L	ND	1.0	02/18/16 13:45	
Bromodichloromethane	ug/L	ND	1.0	02/18/16 13:45	
Bromoform	ug/L	ND	1.0	02/18/16 13:45	
Bromomethane	ug/L	ND	2.0	02/18/16 13:45	
Carbon disulfide	ug/L	ND	2.0	02/18/16 13:45	
Carbon tetrachloride	ug/L	ND	1.0	02/18/16 13:45	
Chlorobenzene	ug/L	ND	1.0	02/18/16 13:45	
Chloroethane	ug/L	ND	1.0	02/18/16 13:45	
Chloroform	ug/L	ND	1.0	02/18/16 13:45	
Chloromethane	ug/L	ND	1.0	02/18/16 13:45	
cis-1,2-Dichloroethene	ug/L	ND	1.0	02/18/16 13:45	
cis-1,3-Dichloropropene	ug/L	ND	1.0	02/18/16 13:45	
Dibromochloromethane	ug/L	ND	1.0	02/18/16 13:45	
Dibromomethane	ug/L	ND	1.0	02/18/16 13:45	
Ethylbenzene	ug/L	ND	1.0	02/18/16 13:45	
Iodomethane	ug/L	ND	5.0	02/18/16 13:45	
Methylene Chloride	ug/L	ND	1.0	02/18/16 13:45	
Styrene	ug/L	ND	1.0	02/18/16 13:45	
Tetrachloroethene	ug/L	ND	1.0	02/18/16 13:45	
Toluene	ug/L	ND	1.0	02/18/16 13:45	
trans-1,2-Dichloroethene	ug/L	ND	1.0	02/18/16 13:45	
trans-1,3-Dichloropropene	ug/L	ND	1.0	02/18/16 13:45	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	02/18/16 13:45	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

METHOD BLANK: 1669161 Matrix: Water

Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008, 92286895009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	02/18/16 13:45	
Trichlorofluoromethane	ug/L	ND	1.0	02/18/16 13:45	
Vinyl acetate	ug/L	ND	2.0	02/18/16 13:45	
Vinyl chloride	ug/L	ND	1.0	02/18/16 13:45	
Xylene (Total)	ug/L	ND	2.0	02/18/16 13:45	
1,2-Dichloroethane-d4 (S)	%	108	70-130	02/18/16 13:45	
4-Bromofluorobenzene (S)	%	96	70-130	02/18/16 13:45	
Toluene-d8 (S)	%	102	70-130	02/18/16 13:45	

LABORATORY CONTROL SAMPLE: 1669162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.3	97	80-125	
1,1,1-Trichloroethane	ug/L	50	49.0	98	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	46.7	93	79-124	
1,1,2-Trichloroethane	ug/L	50	45.8	92	85-125	
1,1-Dichloroethane	ug/L	50	47.5	95	73-126	
1,1-Dichloroethene	ug/L	50	50.8	102	66-135	
1,2,3-Trichloropropane	ug/L	50	47.8	96	75-130	
1,2-Dichlorobenzene	ug/L	50	45.3	91	80-133	
1,2-Dichloroethane	ug/L	50	51.1	102	67-128	
1,2-Dichloropropane	ug/L	50	47.9	96	75-132	
1,4-Dichlorobenzene	ug/L	50	46.6	93	78-130	
2-Butanone (MEK)	ug/L	100	121	121	61-144	
2-Hexanone	ug/L	100	106	106	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	107	107	72-135	
Acetone	ug/L	100	123	123	48-146	
Acrylonitrile	ug/L	250	264	105	40-160	
Benzene	ug/L	50	47.1	94	80-125	
Bromochloromethane	ug/L	50	45.7	91	71-125	
Bromodichloromethane	ug/L	50	48.4	97	78-124	
Bromoform	ug/L	50	53.8	108	71-128	
Bromomethane	ug/L	50	57.6	115	40-160	
Carbon disulfide	ug/L	50	52.1	104	50-160	
Carbon tetrachloride	ug/L	50	49.3	99	69-131	
Chlorobenzene	ug/L	50	46.4	93	81-122	
Chloroethane	ug/L	50	52.3	105	39-148	
Chloroform	ug/L	50	46.0	92	73-127	
Chloromethane	ug/L	50	60.5	121	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.5	95	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.0	100	72-132	
Dibromochloromethane	ug/L	50	52.1	104	78-125	
Dibromomethane	ug/L	50	44.9	90	82-120	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

LABORATORY CONTROL SAMPLE: 1669162

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	47.1	94	79-121	
Iodomethane	ug/L	100	132	132	39-154	
Methylene Chloride	ug/L	50	54.9	110	64-133	
Styrene	ug/L	50	47.2	94	84-126	
Tetrachloroethene	ug/L	50	46.7	93	78-122	
Toluene	ug/L	50	46.0	92	80-121	
trans-1,2-Dichloroethene	ug/L	50	49.2	98	71-127	
trans-1,3-Dichloropropene	ug/L	50	49.1	98	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	68.2	136	40-160	
Trichloroethene	ug/L	50	44.9	90	78-122	
Trichlorofluoromethane	ug/L	50	47.9	96	53-137	
Vinyl acetate	ug/L	100	95.0	95	40-160	
Vinyl chloride	ug/L	50	51.8	104	58-137	
Xylene (Total)	ug/L	150	141	94	81-126	
1,2-Dichloroethane-d4 (S)	%			103	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			102	70-130	

MATRIX SPIKE SAMPLE: 1669164

Parameter	Units	92286895002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.8	99	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.3	106	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.7	98	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.5	98	70-130	
1,1-Dichloroethane	ug/L	ND	20	20.6	103	70-130	
1,1-Dichloroethene	ug/L	ND	20	22.5	113	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	20.2	101	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.8	99	70-130	
1,2-Dichloroethane	ug/L	ND	20	20.5	102	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.2	101	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.6	103	70-130	
2-Butanone (MEK)	ug/L	ND	40	47.4	119	70-130	
2-Hexanone	ug/L	ND	40	43.9	110	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	44.9	112	70-130	
Acetone	ug/L	ND	40	44.5	111	70-130	
Acrylonitrile	ug/L	ND	100	108	108	70-130	
Benzene	ug/L	ND	20	20.7	104	70-148	
Bromochloromethane	ug/L	ND	20	19.1	95	70-130	
Bromodichloromethane	ug/L	ND	20	19.6	98	70-130	
Bromoform	ug/L	ND	20	16.6	83	70-130	
Bromomethane	ug/L	ND	20	17.9	89	70-130	
Carbon disulfide	ug/L	ND	20	21.7	109	70-130	
Carbon tetrachloride	ug/L	ND	20	21.4	107	70-130	
Chlorobenzene	ug/L	ND	20	20.2	101	70-146	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

MATRIX SPIKE SAMPLE: 1669164

Parameter	Units	92286895002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	22.9	115	70-130	
Chloroform	ug/L	ND	20	20.2	101	70-130	
Chloromethane	ug/L	ND	20	24.8	124	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.5	103	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.7	98	70-130	
Dibromochloromethane	ug/L	ND	20	19.5	97	70-130	
Dibromomethane	ug/L	ND	20	18.9	95	70-130	
Ethylbenzene	ug/L	ND	20	20.9	105	70-130	
Iodomethane	ug/L	ND	40	43.9	110	70-130	
Methylene Chloride	ug/L	ND	20	22.1	110	70-130	
Styrene	ug/L	ND	20	19.9	100	70-130	
Tetrachloroethene	ug/L	ND	20	20.3	102	70-130	
Toluene	ug/L	ND	20	20.7	103	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.7	108	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.9	95	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	22.6	113	70-130	
Trichloroethene	ug/L	ND	20	20.1	100	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.4	112	70-130	
Vinyl acetate	ug/L	ND	40	34.3	86	70-130	
Vinyl chloride	ug/L	ND	20	23.1	116	70-130	
1,2-Dichloroethane-d4 (S)	%				103	70-130	
4-Bromofluorobenzene (S)	%				99	70-130	
Toluene-d8 (S)	%				101	70-130	

SAMPLE DUPLICATE: 1669163

Parameter	Units	92286895001 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

SAMPLE DUPLICATE: 1669163

Parameter	Units	92286895001 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	107	102	4		
4-Bromofluorobenzene (S)	%	96	97	0		
Toluene-d8 (S)	%	104	101	3		

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: WET/43121 — Analysis Method: SM 2540C
QC Batch Method: SM 2540C — Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

METHOD BLANK: 1668719 — Matrix: Water
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895006, 92286895007, 92286895008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	02/18/16 11:10	

LABORATORY CONTROL SAMPLE: 1668720

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	246	98	90-110	

SAMPLE DUPLICATE: 1668721

Parameter	Units	92286775001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	113	122	8	5	D6

SAMPLE DUPLICATE: 1668722

Parameter	Units	92286895008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: BG-1 **Lab ID: 92286895001** Collected: 02/16/16 09:45 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.553 ± 0.609 (0.974)** **C:NA T:95%**	pCi/L	03/02/16 18:32	13982-63-3	1g
Radium-228	EPA 904.0	**0.256 ± 0.331 (0.705)** **C:83% T:86%**	pCi/L	03/04/16 11:33	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-5 **Lab ID: 92286895002** Collected: 02/16/16 11:00 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.142 ± 0.441 (1.00) C:NA T:94%**	pCi/L	03/02/16 18:44	13982-63-3	1g
Radium-228	EPA 904.0	**0.154 ± 0.297 (0.653) C:80% T:94%**	pCi/L	03/04/16 15:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: LEACHATE-1 **Lab ID: 92286895003** Collected: 02/16/16 10:50 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.166 ± 0.400 (0.772)** **C:NA T:82%**	pCi/L	03/02/16 19:08	13982-63-3	1g
Radium-228	EPA 904.0	**0.372 ± 0.362 (0.745)** **C:83% T:78%**	pCi/L	03/04/16 15:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-3 **Lab ID: 92286895004** Collected: 02/16/16 12:45 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.18 ± 0.783 (1.00)** **C:NA T:91%**	pCi/L	03/08/16 20:15	13982-63-3	
Radium-228	EPA 904.0	**1.78 ± 0.527 (0.626)** **C:83% T:85%**	pCi/L	03/04/16 15:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: MW-4 **Lab ID: 92286895005** Collected: 02/16/16 16:35 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0693 ± 0.316 (0.510)** **C:NA T:100%**	pCi/L	03/02/16 19:22	13982-63-3	1g
Radium-228	EPA 904.0	**0.171 ± 0.315 (0.690)** **C:83% T:88%**	pCi/L	03/04/16 15:22	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: SW-1 **Lab ID: 92286895006** Collected: 02/16/16 16:50 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.454 ± 0.557 (0.908)** **C:NA T:88%**	pCi/L	03/02/16 19:22	13982-63-3	1g
Radium-228	EPA 904.0	**1.24 ± 0.941 (1.85)** **C:77% T:70%**	pCi/L	03/07/16 16:35	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: AMBIENT BLANK **Lab ID: 92286895007** Collected: 02/16/16 13:45 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.274 ± 0.314 (0.822) C:NA T:95%**	pCi/L	03/02/16 19:08	13982-63-3	1g
Radium-228	EPA 904.0	**0.470 ± 0.332 (0.643) C:82% T:89%**	pCi/L	03/04/16 15:23	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Sample: EQ. BLANK **Lab ID: 92286895008** Collected: 02/16/16 17:00 Received: 02/17/16 15:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.348 (0.561)** **C:NA T:92%**	pCi/L	03/02/16 19:34	13982-63-3	1g
Radium-228	EPA 904.0	**0.405 ± 0.344 (0.692)** **C:80% T:88%**	pCi/L	03/04/16 15:23	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: RADC/28215 | Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 | Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92286895006

METHOD BLANK: 1032694 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.398 ± 0.305 (0.599) C:84% T:90%	pCi/L	03/07/16 12:34	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: RADC/28155 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895004, 92286895005, 92286895007, 92286895008

METHOD BLANK: 1030493 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.279 ± 0.347 (0.736) C:84% T:84%	pCi/L	03/04/16 11:32	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: RADC/28270 | Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 | Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92286895004

METHOD BLANK: 1034091 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.159 ± 0.382 (0.738) C:NA T:96%	pCi/L	03/08/16 19:45	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

QC Batch: RADC/28150 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92286895001, 92286895002, 92286895003, 92286895005, 92286895006, 92286895007, 92286895008

METHOD BLANK: 1030487 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	2.10 ± 0.890 (0.807) C:NA T:100%	pCi/L	03/02/16 18:56	1g

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

1g	Ra-226 was detected in the Method Blank at a level above the associated MDC. Samples with Ra-226 activity below the Routine RL of 1.0 pCi/L or the associated sample MDC are being reported without additional qualification.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92286895001	**BG-1**	EPA 300.0	GWD/2899		
92286895002	**MW-5**	EPA 300.0	GWD/2899		
92286895003	**LEACHATE-1**	EPA 300.0	GWD/2899		
92286895004	**MW-3**	EPA 300.0	GWD/2899		
92286895005	**MW-4**	EPA 300.0	GWD/2899		
92286895006	**SW-1**	EPA 300.0	GWD/2899		
92286895007	**AMBIENT BLANK**	EPA 300.0	GWD/2899		
92286895008	**EQ. BLANK**	EPA 300.0	GWD/2899		
92286895001	**BG-1**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895002	**MW-5**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895003	**LEACHATE-1**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895004	**MW-3**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895005	**MW-4**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895006	**SW-1**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895007	**AMBIENT BLANK**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895008	**EQ. BLANK**	EPA 3010A	MPRP/20737	EPA 6010	ICP/18690
92286895001	**BG-1**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895002	**MW-5**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895003	**LEACHATE-1**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895004	**MW-3**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895005	**MW-4**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895006	**SW-1**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895007	**AMBIENT BLANK**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895008	**EQ. BLANK**	EPA 3020	MPRP/61570	EPA 6020B	ICPM/28426
92286895001	**BG-1**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895002	**MW-5**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895003	**LEACHATE-1**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895004	**MW-3**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895005	**MW-4**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895006	**SW-1**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895007	**AMBIENT BLANK**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895008	**EQ. BLANK**	EPA 7470	MERP/8978	EPA 7470	MERC/8625
92286895001	**BG-1**	EPA 8260	MSV/35624		
92286895002	**MW-5**	EPA 8260	MSV/35624		
92286895003	**LEACHATE-1**	EPA 8260	MSV/35624		
92286895004	**MW-3**	EPA 8260	MSV/35624		
92286895005	**MW-4**	EPA 8260	MSV/35624		
92286895006	**SW-1**	EPA 8260	MSV/35624		
92286895007	**AMBIENT BLANK**	EPA 8260	MSV/35624		
92286895008	**EQ. BLANK**	EPA 8260	MSV/35624		
92286895009	**TRIP BLANK**	EPA 8260	MSV/35624		
92286895001	**BG-1**	EPA 903.1	RADC/28150		
92286895002	**MW-5**	EPA 903.1	RADC/28150		
92286895003	**LEACHATE-1**	EPA 903.1	RADC/28150		
92286895004	**MW-3**	EPA 903.1	RADC/28270		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92286895

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92286895005	**MW-4**	EPA 903.1	RADC/28150		
92286895006	**SW-1**	EPA 903.1	RADC/28150		
92286895007	**AMBIENT BLANK**	EPA 903.1	RADC/28150		
92286895008	**EQ. BLANK**	EPA 903.1	RADC/28150		
92286895001	**BG-1**	EPA 904.0	RADC/28155		
92286895002	**MW-5**	EPA 904.0	RADC/28155		
92286895003	**LEACHATE-1**	EPA 904.0	RADC/28155		
92286895004	**MW-3**	EPA 904.0	RADC/28155		
92286895005	**MW-4**	EPA 904.0	RADC/28155		
92286895006	**SW-1**	EPA 904.0	RADC/28215		
92286895007	**AMBIENT BLANK**	EPA 904.0	RADC/28155		
92286895008	**EQ. BLANK**	EPA 904.0	RADC/28155		
92286895001	**BG-1**	SM 2540C	WET/43121		
92286895002	**MW-5**	SM 2540C	WET/43121		
92286895003	**LEACHATE-1**	SM 2540C	WET/43121		
92286895004	**MW-3**	SM 2540C	WET/43121		
92286895005	**MW-4**	SM 2540C	WET/43121		
92286895006	**SW-1**	SM 2540C	WET/43121		
92286895007	**AMBIENT BLANK**	SM 2540C	WET/43121		
92286895008	**EQ. BLANK**	SM 2540C	WET/43121		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: 26OCT2015 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.17**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO# : 92286895

92286895

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:_____

Custody Seal on Cooler/Box Present? ☐ Yes ☐ No **Seals Intact?** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other:_____

Thermometer Used: ☐ T1505 **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 3.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☐ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C **Date and Initials of Person Examining Contents:** AO 2-17-16

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☐ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☐ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☐ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☐ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☐ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☐ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☐ No	☐ N/A	7.
Sufficient Volume?	☐ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☐ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☐ Yes	☐ No	☐ N/A	
Containers Intact?	☐ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☐ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☐ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WL				
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☐ N/A	
Samples checked for dechlorization	☐ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☐ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):_____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager SCURF Review: _____ **Date:** 2-17-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers).

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995507

Section A Required Client Information:

Company:	HDR
Address:	
Email To:	
Phone:	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Same
Copy To:	
Purchase Order No.:	
Project Name:	Charah - Brickshaven
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	Metals	TDS	Fluoride	Chloride/Sulfate	9260	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92286895
1	BG-1		G			02/16/16	0945		11									3	2	1	1	1	3		001
2	MW-5						1100											3	2	1	1	1	3		002
3	Leachate-1						1050											3	2	1	1	1	3		003
4	MW-3						1245											3	2	1	1	1	3		004
5	MW-4						1635											3	2	1	1	1	3		005
6	SW-1						1650											3	2	1	1	1	3		006
7																									
8	Trip Blank		G			02/16/16	0730		2														2		009
9	Ambient Blank						1345		11									3	2	1	1	1	3		007
10	Eq. Blank						1700		11									3	2	1	1	1	3		008
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	02/16/16	1730	[illegible]	2/17/16	1030				
	[illegible] / Pace	2/17	1505	[illegible]	2-17-16	1505	3.2	✓	✓	✓

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 02/16/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

March 10, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on February 18, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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Huntersville, NC 28078
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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92287054001	**SW-2**	Water	02/17/16 08:15	02/18/16 09:32
92287054002	**MW-2**	Water	02/17/16 11:10	02/18/16 09:32
92287054003	**MW-1**	Water	02/17/16 13:45	02/18/16 09:32
92287054004	**MW-6**	Water	02/17/16 17:55	02/18/16 09:32
92287054005	**MW-1 DUP**	Water	02/17/16 14:00	02/18/16 09:32
92287054006	**AMBIENT BLANK**	Water	02/17/16 16:00	02/18/16 09:32
92287054007	**EQ BLANK**	Water	02/17/16 18:00	02/18/16 09:32
92287054008	**TRIP BLANK**	Water	02/17/16 07:30	02/18/16 09:32

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92287054001	**SW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054002	**MW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054003	**MW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054004	**MW-6**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054005	**MW-1 DUP**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054006	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054007	**EQ BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92287054008	**TRIP BLANK**	EPA 8260	CCL	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92287054001	**SW-2**					
EPA 300.0	Chloride	5.4	mg/L	1.0	02/22/16 17:37	
EPA 300.0	Sulfate	4.5	mg/L	1.0	02/22/16 17:37	
EPA 6010	Barium	47.5	ug/L	5.0	02/23/16 18:44	
EPA 6010	Calcium	5030	ug/L	100	02/23/16 18:44	
EPA 6010	Molybdenum	6.3	ug/L	5.0	02/22/16 22:03	
EPA 6010	Thallium	13.9	ug/L	5.4	02/22/16 22:03	
EPA 6010	Vanadium	6.1	ug/L	5.0	02/22/16 22:03	
EPA 6010	Zinc	16.2	ug/L	10.0	02/22/16 22:03	
EPA 6020B	Boron	14.7	ug/L	5.0	02/22/16 07:27	
EPA 6020B	Lithium	1.5	ug/L	0.50	02/22/16 07:27	
EPA 903.1	Radium-226	-0.170 ± 0.472 (0.990) C:NA T:62%	pCi/L		03/04/16 13:15	
EPA 904.0	Radium-228	-0.147 ± 0.399 (0.973) C:87% T:53%	pCi/L		03/09/16 15:39	
SM 2540C	Total Dissolved Solids	181	mg/L	25.0	02/19/16 18:17	
92287054002	**MW-2**					
EPA 300.0	Chloride	1190	mg/L	25.0	02/23/16 09:13	
EPA 300.0	Fluoride	0.22	mg/L	0.10	02/22/16 17:58	
EPA 300.0	Sulfate	247	mg/L	5.0	02/23/16 03:01	
EPA 6010	Antimony	10.7	ug/L	5.0	02/22/16 22:12	
EPA 6010	Barium	318	ug/L	5.0	02/22/16 22:12	
EPA 6010	Calcium	207000	ug/L	500	02/23/16 19:22	
EPA 6010	Chromium	23.3	ug/L	5.0	02/22/16 22:12	
EPA 6010	Molybdenum	19.1	ug/L	5.0	02/22/16 22:12	
EPA 6010	Nickel	13.5	ug/L	5.0	02/22/16 22:12	
EPA 6010	Thallium	10.3	ug/L	5.4	02/22/16 22:12	
EPA 6010	Zinc	27.2	ug/L	10.0	02/22/16 22:12	
EPA 6020B	Boron	37.4	ug/L	5.0	02/22/16 07:40	
EPA 6020B	Lithium	88.4	ug/L	0.50	02/22/16 07:40	
EPA 903.1	Radium-226	1.22 ± 0.656 (0.237) C:NA T:91%	pCi/L		03/04/16 13:03	
EPA 904.0	Radium-228	1.15 ± 0.496 (0.809) C:81% T:76%	pCi/L		03/09/16 15:38	
SM 2540C	Total Dissolved Solids	2470	mg/L	250	02/19/16 18:17	D6
92287054003	**MW-1**					
EPA 300.0	Chloride	167	mg/L	3.0	02/23/16 03:28	
EPA 300.0	Fluoride	0.16	mg/L	0.10	02/22/16 18:19	
EPA 300.0	Sulfate	8.7	mg/L	1.0	02/22/16 18:19	
EPA 6010	Barium	70.3	ug/L	5.0	02/22/16 22:15	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92287054003	**MW-1**					
EPA 6010	Calcium	57700	ug/L	100	02/23/16 18:57	
EPA 6020B	Boron	10	ug/L	5.0	02/22/16 07:43	
EPA 6020B	Lithium	19.2	ug/L	0.50	02/22/16 07:43	
EPA 903.1	Radium-226	0.276 ± 0.421 (0.249) C:NA T:92%	pCi/L		03/04/16 13:13	
EPA 904.0	Radium-228	0.470 ± 0.369 (0.733) C:80% T:87%	pCi/L		03/09/16 15:38	
SM 2540C	Total Dissolved Solids	593	mg/L	25.0	02/19/16 18:18	
92287054004	**MW-6**					
EPA 300.0	Chloride	242	mg/L	5.0	02/23/16 03:56	
EPA 300.0	Fluoride	0.34	mg/L	0.10	02/22/16 18:40	
EPA 300.0	Sulfate	87.7	mg/L	1.0	02/22/16 18:40	
EPA 6010	Barium	118	ug/L	5.0	02/22/16 22:27	
EPA 6010	Calcium	39200	ug/L	100	02/23/16 19:00	
EPA 6020B	Boron	6.6	ug/L	5.0	02/22/16 07:45	
EPA 6020B	Lithium	37.1	ug/L	0.50	02/22/16 07:45	
EPA 903.1	Radium-226	0.0812 ± 0.421 (0.874) C:NA T:98%	pCi/L		03/04/16 13:30	
EPA 904.0	Radium-228	0.249 ± 0.328 (0.698) C:84% T:84%	pCi/L		03/09/16 15:38	
SM 2540C	Total Dissolved Solids	783	mg/L	25.0	02/19/16 18:18	
92287054005	**MW-1 DUP**					
EPA 300.0	Chloride	208	mg/L	4.0	02/23/16 04:24	
EPA 300.0	Fluoride	0.15	mg/L	0.10	02/22/16 19:01	
EPA 300.0	Sulfate	9.3	mg/L	1.0	02/22/16 19:01	
EPA 6010	Barium	89.3	ug/L	5.0	02/22/16 22:30	
EPA 6010	Calcium	68000	ug/L	100	02/23/16 19:12	
EPA 6020B	Boron	9.2	ug/L	5.0	02/22/16 07:53	
EPA 6020B	Lithium	19.7	ug/L	0.50	02/22/16 07:53	
EPA 903.1	Radium-226	0.534 ± 0.608 (0.958) C:NA T:97%	pCi/L		03/04/16 13:26	
EPA 904.0	Radium-228	-0.103 ± 0.303 (0.731) C:81% T:83%	pCi/L		03/09/16 15:38	
SM 2540C	Total Dissolved Solids	660	mg/L	25.0	02/19/16 18:18	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92287054006	**AMBIENT BLANK**					
EPA 6020B	Boron	19.0	ug/L	5.0	02/22/16 07:56	
EPA 903.1	Radium-226	0.0880 ± 0.402 (0.648) C:NA T:99%	pCi/L		03/04/16 12:50	
EPA 904.0	Radium-228	0.270 ± 0.425 (0.922) C:75% T:82%	pCi/L		03/09/16 15:39	
SM 2540C	Total Dissolved Solids	93.0	mg/L	25.0	02/19/16 18:19	
92287054007	**EQ BLANK**					
EPA 6020B	Boron	19.0	ug/L	5.0	02/22/16 07:58	
EPA 903.1	Radium-226	0.310 ± 0.557 (0.952) C:NA T:92%	pCi/L		03/04/16 13:24	
EPA 904.0	Radium-228	0.0215 ± 0.309 (0.716) C:79% T:84%	pCi/L		03/09/16 15:39	
SM 2540C	Total Dissolved Solids	72.0	mg/L	25.0	02/19/16 18:19	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: SW-2 **Lab ID: 92287054001** Collected: 02/17/16 08:15 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**5.4**	mg/L	1.0	1		02/22/16 17:37	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/22/16 17:37	16984-48-8	
Sulfate	**4.5**	mg/L	1.0	1		02/22/16 17:37	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:03	7440-38-2	
Barium	**47.5**	ug/L	5.0	1	02/19/16 17:30	02/23/16 18:44	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:03	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:03	7440-43-9	
Calcium	**5030**	ug/L	100	1	02/19/16 17:30	02/23/16 18:44	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7439-92-1	
Molybdenum	**6.3**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:03	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-22-4	
Thallium	**13.9**	ug/L	5.4	1	02/19/16 17:30	02/22/16 22:03	7440-28-0	
Vanadium	**6.1**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:03	7440-62-2	
Zinc	**16.2**	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:03	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**14.7**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:27	7440-42-8	
Lithium	**1.5**	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:27	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:24	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 17:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 17:35	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 17:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 17:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 17:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 17:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 17:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 17:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 17:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 17:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 17:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 17:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 17:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 17:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 17:35	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: SW-2 **Lab ID: 92287054001** Collected: 02/17/16 08:15 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 17:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 17:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 17:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 17:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 17:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 17:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 17:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 17:35	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 17:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 17:35	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 17:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 17:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 17:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 17:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 17:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 17:35	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 17:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		02/19/16 17:35	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		02/19/16 17:35	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		02/19/16 17:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**181**	mg/L	25.0	1		02/19/16 18:17		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-2 **Lab ID: 92287054002** Collected: 02/17/16 11:10 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1190**	mg/L	25.0	25		02/23/16 09:13	16887-00-6	
Fluoride	**0.22**	mg/L	0.10	1		02/22/16 17:58	16984-48-8	
Sulfate	**247**	mg/L	5.0	5		02/23/16 03:01	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**10.7**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:12	7440-38-2	
Barium	**318**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 18:53	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:12	7440-43-9	
Calcium	**207000**	ug/L	500	5	02/19/16 17:30	02/23/16 19:22	7440-70-2	
Chromium	**23.3**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7439-92-1	
Molybdenum	**19.1**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7439-98-7	
Nickel	**13.5**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:12	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-22-4	
Thallium	**10.3**	ug/L	5.4	1	02/19/16 17:30	02/22/16 22:12	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:12	7440-62-2	
Zinc	**27.2**	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:12	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**37.4**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:40	7440-42-8	
Lithium	**88.4**	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:40	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:31	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 17:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 17:52	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 17:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 17:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 17:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 17:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 17:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 17:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 17:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 17:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 17:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 17:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 17:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 17:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 17:52	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-2 **Lab ID: 92287054002** Collected: 02/17/16 11:10 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 17:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 17:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 17:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 17:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 17:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 17:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 17:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 17:52	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 17:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 17:52	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 17:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 17:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 17:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 17:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 17:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 17:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 17:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		02/19/16 17:52	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		02/19/16 17:52	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/19/16 17:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2470**	mg/L	250	1		02/19/16 18:17		D6

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-1 **Lab ID: 92287054003** Collected: 02/17/16 13:45 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**167**	mg/L	3.0	3		02/23/16 03:28	16887-00-6	
Fluoride	**0.16**	mg/L	0.10	1		02/22/16 18:19	16984-48-8	
Sulfate	**8.7**	mg/L	1.0	1		02/22/16 18:19	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:15	7440-38-2	
Barium	**70.3**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 18:57	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:15	7440-43-9	
Calcium	**57700**	ug/L	100	1	02/19/16 17:30	02/23/16 18:57	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:15	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/19/16 17:30	02/22/16 22:15	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:15	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:15	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:43	7440-42-8	
Lithium	**19.2**	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:43	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:34	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 18:08	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 18:08	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 18:08	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 18:08	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 18:08	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 18:08	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 18:08	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 18:08	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 18:08	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 18:08	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 18:08	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 18:08	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 18:08	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 18:08	74-87-3	M1
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 18:08	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-1 **Lab ID: 92287054003** Collected: 02/17/16 13:45 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 18:08	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 18:08	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 18:08	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 18:08	110-57-6	M1
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 18:08	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 18:08	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:08	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:08	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:08	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 18:08	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 18:08	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 18:08	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 18:08	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 18:08	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 18:08	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 18:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 18:08	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 18:08	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 18:08	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 18:08	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 18:08	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 18:08	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 18:08	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 18:08	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 18:08	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 18:08	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 18:08	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 18:08	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 18:08	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 18:08	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		02/19/16 18:08	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		02/19/16 18:08	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/19/16 18:08	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**593**	mg/L	25.0	1		02/19/16 18:18		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-6 **Lab ID: 92287054004** Collected: 02/17/16 17:55 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**242**	mg/L	5.0	5		02/23/16 03:56	16887-00-6	
Fluoride	**0.34**	mg/L	0.10	1		02/22/16 18:40	16984-48-8	
Sulfate	**87.7**	mg/L	1.0	1		02/22/16 18:40	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:27	7440-38-2	
Barium	**118**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 19:00	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:27	7440-43-9	
Calcium	**39200**	ug/L	100	1	02/19/16 17:30	02/23/16 19:00	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:00	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:27	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/19/16 17:30	02/22/16 22:27	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:27	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:27	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.6**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:45	7440-42-8	
Lithium	**37.1**	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:45	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:36	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 18:25	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 18:25	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 18:25	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 18:25	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 18:25	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 18:25	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 18:25	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 18:25	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 18:25	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 18:25	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 18:25	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 18:25	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 18:25	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 18:25	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 18:25	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-6 **Lab ID: 92287054004** Collected: 02/17/16 17:55 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 18:25	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 18:25	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 18:25	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 18:25	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 18:25	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 18:25	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:25	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:25	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:25	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 18:25	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 18:25	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 18:25	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 18:25	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 18:25	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 18:25	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 18:25	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 18:25	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 18:25	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 18:25	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 18:25	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 18:25	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 18:25	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 18:25	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 18:25	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 18:25	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 18:25	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 18:25	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 18:25	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 18:25	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 18:25	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		02/19/16 18:25	460-00-4	
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		02/19/16 18:25	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/19/16 18:25	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**783**	mg/L	25.0	1		02/19/16 18:18		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-1 DUP **Lab ID: 92287054005** Collected: 02/17/16 14:00 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**208**	mg/L	4.0	4		02/23/16 04:24	16887-00-6	
Fluoride	**0.15**	mg/L	0.10	1		02/22/16 19:01	16984-48-8	
Sulfate	**9.3**	mg/L	1.0	1		02/22/16 19:01	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:30	7440-38-2	
Barium	**89.3**	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 19:12	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:30	7440-43-9	
Calcium	**68000**	ug/L	100	1	02/19/16 17:30	02/23/16 19:12	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:12	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:30	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/19/16 17:30	02/22/16 22:30	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:30	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:30	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.2**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:53	7440-42-8	
Lithium	**19.7**	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:53	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:38	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 18:58	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 18:58	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 18:58	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 18:58	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 18:58	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 18:58	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 18:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 18:58	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 18:58	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 18:58	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 18:58	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 18:58	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 18:58	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 18:58	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 18:58	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-1 DUP **Lab ID: 92287054005** Collected: 02/17/16 14:00 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 18:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 18:58	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 18:58	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 18:58	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 18:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 18:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 18:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 18:58	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 18:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 18:58	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 18:58	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 18:58	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 18:58	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 18:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 18:58	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 18:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 18:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 18:58	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 18:58	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 18:58	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 18:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 18:58	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 18:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 18:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 18:58	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 18:58	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 18:58	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 18:58	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		02/19/16 18:58	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	70-130	1		02/19/16 18:58	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/19/16 18:58	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**660**	mg/L	25.0	1		02/19/16 18:18		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: AMBIENT BLANK **Lab ID: 92287054006** Collected: 02/17/16 16:00 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		02/22/16 19:22	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/22/16 19:22	16984-48-8	
Sulfate	ND	mg/L	1.0	1		02/22/16 19:22	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:34	7440-38-2	
Barium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 19:15	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/22/16 22:34	7440-43-9	
Calcium	ND	ug/L	100	1	02/19/16 17:30	02/23/16 19:15	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:15	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:34	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/19/16 17:30	02/22/16 22:34	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/19/16 17:30	02/22/16 22:34	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/19/16 17:30	02/22/16 22:34	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**19.0**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:56	7440-42-8	
Lithium	ND	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:56	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:41	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 16:45	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 16:45	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 16:45	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 16:45	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 16:45	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 16:45	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 16:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 16:45	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 16:45	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 16:45	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 16:45	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 16:45	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 16:45	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 16:45	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 16:45	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: AMBIENT BLANK **Lab ID: 92287054006** Collected: 02/17/16 16:00 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 16:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 16:45	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 16:45	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 16:45	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 16:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 16:45	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 16:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 16:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 16:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 16:45	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 16:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 16:45	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 16:45	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 16:45	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 16:45	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 16:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 16:45	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 16:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 16:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 16:45	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 16:45	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 16:45	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 16:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 16:45	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 16:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 16:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 16:45	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 16:45	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 16:45	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 16:45	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		02/19/16 16:45	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	1		02/19/16 16:45	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/19/16 16:45	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**93.0**	mg/L	25.0	1		02/19/16 18:19		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: EQ BLANK **Lab ID: 92287054007** Collected: 02/17/16 18:00 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		02/22/16 19:43	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/22/16 19:43	16984-48-8	
Sulfate	ND	mg/L	1.0	1		02/22/16 19:43	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/19/16 17:30	02/23/16 19:18	7440-38-2	
Barium	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 19:18	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/19/16 17:30	02/23/16 19:18	7440-43-9	
Calcium	ND	ug/L	100	1	02/19/16 17:30	02/23/16 19:18	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-48-4	
Copper	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-50-8	
Lead	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/19/16 17:30	02/23/16 19:18	7782-49-2	
Silver	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/19/16 17:30	02/23/16 19:18	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/19/16 17:30	02/23/16 19:18	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/19/16 17:30	02/23/16 19:18	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**19.0**	ug/L	5.0	1	02/21/16 20:32	02/22/16 07:58	7440-42-8	
Lithium	ND	ug/L	0.50	1	02/21/16 20:32	02/22/16 07:58	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/22/16 16:20	02/24/16 14:43	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 17:02	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 17:02	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 17:02	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 17:02	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 17:02	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 17:02	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 17:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 17:02	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 17:02	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 17:02	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 17:02	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 17:02	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 17:02	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 17:02	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 17:02	124-48-1	

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(704)875-9092

ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: EQ BLANK **Lab ID: 92287054007** Collected: 02/17/16 18:00 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/19/16 17:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:02	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:02	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 17:02	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:02	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 17:02	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:02	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 17:02	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 17:02	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 17:02	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 17:02	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 17:02	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 17:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:02	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 17:02	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 17:02	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:02	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 17:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 17:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 17:02	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 17:02	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 17:02	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 17:02	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		02/19/16 17:02	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		02/19/16 17:02	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		02/19/16 17:02	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**72.0**	mg/L	25.0	1		02/19/16 18:19		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: TRIP BLANK **Lab ID: 92287054008** Collected: 02/17/16 07:30 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/19/16 17:19	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/19/16 17:19	107-13-1	
Benzene	ND	ug/L	1.0	1		02/19/16 17:19	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/19/16 17:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/19/16 17:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/19/16 17:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/19/16 17:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/19/16 17:19	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/19/16 17:19	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/19/16 17:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/19/16 17:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/19/16 17:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/19/16 17:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/19/16 17:19	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/19/16 17:19	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		02/19/16 17:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:19	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/19/16 17:19	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/19/16 17:19	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/19/16 17:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/19/16 17:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/19/16 17:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/19/16 17:19	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/19/16 17:19	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/19/16 17:19	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/19/16 17:19	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/19/16 17:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/19/16 17:19	108-10-1	
Styrene	ND	ug/L	1.0	1		02/19/16 17:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/19/16 17:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/19/16 17:19	127-18-4	
Toluene	ND	ug/L	1.0	1		02/19/16 17:19	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/19/16 17:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/19/16 17:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/19/16 17:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/19/16 17:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/19/16 17:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/19/16 17:19	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/19/16 17:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		02/19/16 17:19	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: TRIP BLANK **Lab ID: 92287054008** Collected: 02/17/16 07:30 Received: 02/18/16 09:32 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	95	%	70-130	1		02/19/16 17:19	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/19/16 17:19	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: GWD/2899 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 1670717 | Matrix: Water
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/22/16 12:42	
Fluoride	mg/L	ND	0.10	02/22/16 12:42	
Sulfate	mg/L	ND	1.0	02/22/16 12:42	

LABORATORY CONTROL SAMPLE: 1670718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.2	98	90-110	
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	50	48.2	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1670719 1670720

Parameter	Units	92286895001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	277	50	50	254	225	-46	-105	90-110	12	20	M6
Fluoride	mg/L	0.13	2.5	2.5	2.4	2.5	91	94	90-110	3	20	
Sulfate	mg/L	18.6	50	50	67.0	67.6	97	98	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1670721 1670722

Parameter	Units	92286721048 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.3	50	50	50.2	51.9	94	97	90-110	3	20	
Fluoride	mg/L	ND	2.5	2.5	2.3	2.4	87	93	90-110	7	20	M1
Sulfate	mg/L	2.0	50	50	47.6	49.6	91	95	90-110	4	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: MERP/8979 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 1669821 Matrix: Water
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	02/24/16 14:03	

LABORATORY CONTROL SAMPLE: 1669822

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1669823 1669825

Parameter	Units	92286924008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	91	88	75-125	3	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: MPRP/20745 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 1670077 | Matrix: Water
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	02/22/16 21:57	
Arsenic	ug/L	ND	10.0	02/22/16 21:57	
Barium	ug/L	ND	5.0	02/22/16 21:57	
Beryllium	ug/L	ND	1.0	02/23/16 18:38	
Cadmium	ug/L	ND	1.0	02/22/16 21:57	
Calcium	ug/L	ND	100	02/23/16 18:38	
Chromium	ug/L	ND	5.0	02/22/16 21:57	
Cobalt	ug/L	ND	5.0	02/22/16 21:57	
Copper	ug/L	ND	5.0	02/22/16 21:57	
Lead	ug/L	ND	5.0	02/22/16 21:57	
Molybdenum	ug/L	ND	5.0	02/22/16 21:57	
Nickel	ug/L	ND	5.0	02/22/16 21:57	
Selenium	ug/L	ND	10.0	02/22/16 21:57	
Silver	ug/L	ND	5.0	02/22/16 21:57	
Thallium	ug/L	ND	5.4	02/22/16 21:57	
Vanadium	ug/L	ND	5.0	02/22/16 21:57	
Zinc	ug/L	ND	10.0	02/22/16 21:57	

LABORATORY CONTROL SAMPLE: 1670078

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	443	89	80-120	
Arsenic	ug/L	500	486	97	80-120	
Barium	ug/L	500	469	94	80-120	
Beryllium	ug/L	500	522	104	80-120	
Cadmium	ug/L	500	497	99	80-120	
Calcium	ug/L	5000	5520	110	80-120	
Chromium	ug/L	500	469	94	80-120	
Cobalt	ug/L	500	492	98	80-120	
Copper	ug/L	500	483	97	80-120	
Lead	ug/L	500	489	98	80-120	
Molybdenum	ug/L	500	456	91	80-120	
Nickel	ug/L	500	491	98	80-120	
Selenium	ug/L	500	498	100	80-120	
Silver	ug/L	250	211	84	80-120	
Thallium	ug/L	500	490	98	80-120	
Vanadium	ug/L	500	474	95	80-120	
Zinc	ug/L	500	485	97	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1670079 1670080

Parameter	Units	92287054001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	430	434	86	87	75-125	1	25	
Arsenic	ug/L	ND	500	500	484	492	97	98	75-125	2	25	
Barium	ug/L	47.5	500	500	539	564	98	103	75-125	5	25	
Beryllium	ug/L	ND	500	500	522	544	104	109	75-125	4	25	
Cadmium	ug/L	ND	500	500	494	499	99	100	75-125	1	25	
Calcium	ug/L	5030	5000	5000	10300	10600	105	112	75-125	3	25	
Chromium	ug/L	ND	500	500	485	466	96	93	75-125	4	25	
Cobalt	ug/L	ND	500	500	486	492	97	98	75-125	1	25	
Copper	ug/L	ND	500	500	504	486	100	96	75-125	4	25	
Lead	ug/L	ND	500	500	485	492	97	98	75-125	1	25	
Molybdenum	ug/L	6.3	500	500	453	466	89	92	75-125	3	25	
Nickel	ug/L	ND	500	500	485	490	97	98	75-125	1	25	
Selenium	ug/L	ND	500	500	491	496	97	98	75-125	1	25	
Silver	ug/L	ND	250	250	218	210	87	84	75-125	3	25	
Thallium	ug/L	13.9	500	500	496	518	96	101	75-125	4	25	
Vanadium	ug/L	6.1	500	500	493	476	97	94	75-125	4	25	
Zinc	ug/L	16.2	500	500	491	498	95	96	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: MPRP/61566 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 2196051 Matrix: Water
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/22/16 07:22	
Lithium	ug/L	ND	0.50	02/22/16 07:22	

LABORATORY CONTROL SAMPLE: 2196052

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	77.8	97	80-120	
Lithium	ug/L	80	75.9	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2196053 2196054

Parameter	Units	92287054001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	14.7	80	80	90.1	91.0	94	95	75-125	1	20	
Lithium	ug/L	1.5	80	80	77.6	77.9	95	95	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: MSV/35644 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007, 92287054008

METHOD BLANK: 1670021 Matrix: Water
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007, 92287054008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	02/19/16 16:29	
1,1,1-Trichloroethane	ug/L	ND	1.0	02/19/16 16:29	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	02/19/16 16:29	
1,1,2-Trichloroethane	ug/L	ND	1.0	02/19/16 16:29	
1,1-Dichloroethane	ug/L	ND	1.0	02/19/16 16:29	
1,1-Dichloroethene	ug/L	ND	1.0	02/19/16 16:29	
1,2,3-Trichloropropane	ug/L	ND	1.0	02/19/16 16:29	
1,2-Dichlorobenzene	ug/L	ND	1.0	02/19/16 16:29	
1,2-Dichloroethane	ug/L	ND	1.0	02/19/16 16:29	
1,2-Dichloropropane	ug/L	ND	1.0	02/19/16 16:29	
1,4-Dichlorobenzene	ug/L	ND	1.0	02/19/16 16:29	
2-Butanone (MEK)	ug/L	ND	5.0	02/19/16 16:29	
2-Hexanone	ug/L	ND	5.0	02/19/16 16:29	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	02/19/16 16:29	
Acetone	ug/L	ND	25.0	02/19/16 16:29	
Acrylonitrile	ug/L	ND	10.0	02/19/16 16:29	
Benzene	ug/L	ND	1.0	02/19/16 16:29	
Bromochloromethane	ug/L	ND	1.0	02/19/16 16:29	
Bromodichloromethane	ug/L	ND	1.0	02/19/16 16:29	
Bromoform	ug/L	ND	1.0	02/19/16 16:29	
Bromomethane	ug/L	ND	2.0	02/19/16 16:29	
Carbon disulfide	ug/L	ND	2.0	02/19/16 16:29	
Carbon tetrachloride	ug/L	ND	1.0	02/19/16 16:29	
Chlorobenzene	ug/L	ND	1.0	02/19/16 16:29	
Chloroethane	ug/L	ND	1.0	02/19/16 16:29	
Chloroform	ug/L	ND	1.0	02/19/16 16:29	
Chloromethane	ug/L	ND	1.0	02/19/16 16:29	
cis-1,2-Dichloroethene	ug/L	ND	1.0	02/19/16 16:29	
cis-1,3-Dichloropropene	ug/L	ND	1.0	02/19/16 16:29	
Dibromochloromethane	ug/L	ND	1.0	02/19/16 16:29	
Dibromomethane	ug/L	ND	1.0	02/19/16 16:29	
Ethylbenzene	ug/L	ND	1.0	02/19/16 16:29	
Iodomethane	ug/L	ND	5.0	02/19/16 16:29	
Methylene Chloride	ug/L	ND	1.0	02/19/16 16:29	
Styrene	ug/L	ND	1.0	02/19/16 16:29	
Tetrachloroethene	ug/L	ND	1.0	02/19/16 16:29	
Toluene	ug/L	ND	1.0	02/19/16 16:29	
trans-1,2-Dichloroethene	ug/L	ND	1.0	02/19/16 16:29	
trans-1,3-Dichloropropene	ug/L	ND	1.0	02/19/16 16:29	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	02/19/16 16:29	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

METHOD BLANK: 1670021 Matrix: Water

Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007, 92287054008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	02/19/16 16:29	
Trichlorofluoromethane	ug/L	ND	1.0	02/19/16 16:29	
Vinyl acetate	ug/L	ND	2.0	02/19/16 16:29	
Vinyl chloride	ug/L	ND	1.0	02/19/16 16:29	
Xylene (Total)	ug/L	ND	2.0	02/19/16 16:29	
1,2-Dichloroethane-d4 (S)	%	92	70-130	02/19/16 16:29	
4-Bromofluorobenzene (S)	%	98	70-130	02/19/16 16:29	
Toluene-d8 (S)	%	102	70-130	02/19/16 16:29	

LABORATORY CONTROL SAMPLE: 1670022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.3	99	80-125	
1,1,1-Trichloroethane	ug/L	50	47.1	94	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	47.7	95	79-124	
1,1,2-Trichloroethane	ug/L	50	48.0	96	85-125	
1,1-Dichloroethane	ug/L	50	45.3	91	73-126	
1,1-Dichloroethene	ug/L	50	48.9	98	66-135	
1,2,3-Trichloropropane	ug/L	50	49.1	98	75-130	
1,2-Dichlorobenzene	ug/L	50	47.3	95	80-133	
1,2-Dichloroethane	ug/L	50	42.5	85	67-128	
1,2-Dichloropropane	ug/L	50	47.4	95	75-132	
1,4-Dichlorobenzene	ug/L	50	48.7	97	78-130	
2-Butanone (MEK)	ug/L	100	94.4	94	61-144	
2-Hexanone	ug/L	100	99.0	99	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	98.3	98	72-135	
Acetone	ug/L	100	90.5	91	48-146	
Acrylonitrile	ug/L	250	236	94	40-160	
Benzene	ug/L	50	47.2	94	80-125	
Bromochloromethane	ug/L	50	49.8	100	71-125	
Bromodichloromethane	ug/L	50	48.4	97	78-124	
Bromoform	ug/L	50	50.6	101	71-128	
Bromomethane	ug/L	50	34.9	70	40-160	
Carbon disulfide	ug/L	50	54.8	110	50-160	
Carbon tetrachloride	ug/L	50	50.2	100	69-131	
Chlorobenzene	ug/L	50	48.1	96	81-122	
Chloroethane	ug/L	50	39.9	80	39-148	
Chloroform	ug/L	50	46.3	93	73-127	
Chloromethane	ug/L	50	39.6	79	44-146	
cis-1,2-Dichloroethene	ug/L	50	46.4	93	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.8	102	72-132	
Dibromochloromethane	ug/L	50	50.2	100	78-125	
Dibromomethane	ug/L	50	50.5	101	82-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

LABORATORY CONTROL SAMPLE: 1670022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	47.4	95	79-121	
Iodomethane	ug/L	100	86.3	86	39-154	
Methylene Chloride	ug/L	50	49.0	98	64-133	
Styrene	ug/L	50	48.6	97	84-126	
Tetrachloroethene	ug/L	50	47.3	95	78-122	
Toluene	ug/L	50	47.5	95	80-121	
trans-1,2-Dichloroethene	ug/L	50	47.7	95	71-127	
trans-1,3-Dichloropropene	ug/L	50	50.6	101	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	49.1	98	40-160	
Trichloroethene	ug/L	50	48.1	96	78-122	
Trichlorofluoromethane	ug/L	50	46.7	93	53-137	
Vinyl acetate	ug/L	100	89.7	90	40-160	
Vinyl chloride	ug/L	50	48.8	98	58-137	
Xylene (Total)	ug/L	150	139	93	81-126	
1,2-Dichloroethane-d4 (S)	%			92	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE SAMPLE: 1670023

Parameter	Units	92287054003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.4	97	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	20.5	102	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	18.3	91	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.8	99	70-130	
1,1-Dichloroethane	ug/L	ND	20	19.1	95	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.5	108	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.3	97	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.6	98	70-130	
1,2-Dichloroethane	ug/L	ND	20	17.7	88	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.3	101	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.3	102	70-130	
2-Butanone (MEK)	ug/L	ND	40	31.8	80	70-130	
2-Hexanone	ug/L	ND	40	34.7	87	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.0	97	70-130	
Acetone	ug/L	ND	40	30.5	74	70-130	
Acrylonitrile	ug/L	ND	100	88.3	88	70-130	
Benzene	ug/L	ND	20	20.5	102	70-148	
Bromochloromethane	ug/L	ND	20	20.3	102	70-130	
Bromodichloromethane	ug/L	ND	20	19.8	99	70-130	
Bromoform	ug/L	ND	20	16.0	80	70-130	
Bromomethane	ug/L	ND	20	9.2	46	70-130	M1
Carbon disulfide	ug/L	ND	20	23.1	116	70-130	
Carbon tetrachloride	ug/L	ND	20	21.9	110	70-130	
Chlorobenzene	ug/L	ND	20	20.1	101	70-146	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

MATRIX SPIKE SAMPLE: 1670023

Parameter	Units	92287054003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	19.8	99	70-130	
Chloroform	ug/L	ND	20	20.7	101	70-130	
Chloromethane	ug/L	ND	20	13.0	65	70-130	M1
cis-1,2-Dichloroethene	ug/L	ND	20	19.9	100	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.3	96	70-130	
Dibromochloromethane	ug/L	ND	20	19.0	95	70-130	
Dibromomethane	ug/L	ND	20	21.1	105	70-130	
Ethylbenzene	ug/L	ND	20	19.8	99	70-130	
Iodomethane	ug/L	ND	40	16.1	40	70-130	M1
Methylene Chloride	ug/L	ND	20	17.8	89	70-130	
Styrene	ug/L	ND	20	19.8	99	70-130	
Tetrachloroethene	ug/L	ND	20	20.3	101	70-130	
Toluene	ug/L	ND	20	20.4	102	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	20.2	101	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.3	91	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	6.1	30	70-130	M1
Trichloroethene	ug/L	ND	20	20.9	105	69-151	
Trichlorofluoromethane	ug/L	ND	20	20.9	104	70-130	
Vinyl acetate	ug/L	ND	40	33.8	85	70-130	
Vinyl chloride	ug/L	ND	20	19.7	99	70-130	
1,2-Dichloroethane-d4 (S)	%				92	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				101	70-130	

SAMPLE DUPLICATE: 1670024

Parameter	Units	92287054004 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

SAMPLE DUPLICATE: 1670024

Parameter	Units	92287054004 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	95	95	0		
4-Bromofluorobenzene (S)	%	101	101	0		
Toluene-d8 (S)	%	101	102	1		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: WET/43149 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 1669981 Matrix: Water
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	02/19/16 18:12	

LABORATORY CONTROL SAMPLE: 1669982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	260	104	90-110	

SAMPLE DUPLICATE: 1669983

Parameter	Units	92287091001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	82.0	55.0	39	5	D6

SAMPLE DUPLICATE: 1669984

Parameter	Units	92287054002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2470	2920	17	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: SW-2 **Lab ID: 92287054001** Collected: 02/17/16 08:15 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.170 ± 0.472 (0.990) C:NA T:62%**	pCi/L	03/04/16 13:15	13982-63-3	
Radium-228	EPA 904.0	**-0.147 ± 0.399 (0.973) C:87% T:53%**	pCi/L	03/09/16 15:39	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-2 **Lab ID: 92287054002** Collected: 02/17/16 11:10 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.22 ± 0.656 (0.237) C:NA T:91%**	pCi/L	03/04/16 13:03	13982-63-3	
Radium-228	EPA 904.0	**1.15 ± 0.496 (0.809) C:81% T:76%**	pCi/L	03/09/16 15:38	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-1 **Lab ID: 92287054003** Collected: 02/17/16 13:45 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.276 ± 0.421 (0.249)** **C:NA T:92%**	pCi/L	03/04/16 13:13	13982-63-3	
Radium-228	EPA 904.0	**0.470 ± 0.369 (0.733)** **C:80% T:87%**	pCi/L	03/09/16 15:38	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-6 **Lab ID: 92287054004** Collected: 02/17/16 17:55 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0812 ± 0.421 (0.874)** **C:NA T:98%**	pCi/L	03/04/16 13:30	13982-63-3	
Radium-228	EPA 904.0	**0.249 ± 0.328 (0.698)** **C:84% T:84%**	pCi/L	03/09/16 15:38	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: MW-1 DUP **Lab ID: 92287054005** Collected: 02/17/16 14:00 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.534 ± 0.608 (0.958)** **C:NA T:97%**	pCi/L	03/04/16 13:26	13982-63-3	
Radium-228	EPA 904.0	**-0.103 ± 0.303 (0.731)** **C:81% T:83%**	pCi/L	03/09/16 15:38	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: AMBIENT BLANK **Lab ID: 92287054006** Collected: 02/17/16 16:00 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0880 ± 0.402 (0.648)** **C:NA T:99%**	pCi/L	03/04/16 12:50	13982-63-3	
Radium-228	EPA 904.0	**0.270 ± 0.425 (0.922)** **C:75% T:82%**	pCi/L	03/09/16 15:39	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Sample: EQ BLANK **Lab ID: 92287054007** Collected: 02/17/16 18:00 Received: 02/18/16 09:32 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.310 ± 0.557 (0.952) C:NA T:92%**	pCi/L	03/04/16 13:24	13982-63-3	
Radium-228	EPA 904.0	**0.0215 ± 0.309 (0.716) C:79% T:84%**	pCi/L	03/09/16 15:39	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: RADC/28151 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 1030488 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.406 (0.241) C:NA T:96%	pCi/L	03/04/16 13:03	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

QC Batch: RADC/28157 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92287054001, 92287054002, 92287054003, 92287054004, 92287054005, 92287054006, 92287054007

METHOD BLANK: 1030495 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.300 ± 0.279 (0.568) C:93% T:90%	pCi/L	03/09/16 15:37	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92287054001	**SW-2**	EPA 300.0	GWD/2899		
92287054002	**MW-2**	EPA 300.0	GWD/2899		
92287054003	**MW-1**	EPA 300.0	GWD/2899		
92287054004	**MW-6**	EPA 300.0	GWD/2899		
92287054005	**MW-1 DUP**	EPA 300.0	GWD/2899		
92287054006	**AMBIENT BLANK**	EPA 300.0	GWD/2899		
92287054007	**EQ BLANK**	EPA 300.0	GWD/2899		
92287054001	**SW-2**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054002	**MW-2**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054003	**MW-1**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054004	**MW-6**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054005	**MW-1 DUP**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054006	**AMBIENT BLANK**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054007	**EQ BLANK**	EPA 3010A	MPRP/20745	EPA 6010	ICP/18698
92287054001	**SW-2**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054002	**MW-2**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054003	**MW-1**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054004	**MW-6**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054005	**MW-1 DUP**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054006	**AMBIENT BLANK**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054007	**EQ BLANK**	EPA 3020	MPRP/61566	EPA 6020B	ICPM/28413
92287054001	**SW-2**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054002	**MW-2**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054003	**MW-1**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054004	**MW-6**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054005	**MW-1 DUP**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054006	**AMBIENT BLANK**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054007	**EQ BLANK**	EPA 7470	MERP/8979	EPA 7470	MERC/8631
92287054001	**SW-2**	EPA 8260	MSV/35644		
92287054002	**MW-2**	EPA 8260	MSV/35644		
92287054003	**MW-1**	EPA 8260	MSV/35644		
92287054004	**MW-6**	EPA 8260	MSV/35644		
92287054005	**MW-1 DUP**	EPA 8260	MSV/35644		
92287054006	**AMBIENT BLANK**	EPA 8260	MSV/35644		
92287054007	**EQ BLANK**	EPA 8260	MSV/35644		
92287054008	**TRIP BLANK**	EPA 8260	MSV/35644		
92287054001	**SW-2**	EPA 903.1	RADC/28151		
92287054002	**MW-2**	EPA 903.1	RADC/28151		
92287054003	**MW-1**	EPA 903.1	RADC/28151		
92287054004	**MW-6**	EPA 903.1	RADC/28151		
92287054005	**MW-1 DUP**	EPA 903.1	RADC/28151		
92287054006	**AMBIENT BLANK**	EPA 903.1	RADC/28151		
92287054007	**EQ BLANK**	EPA 903.1	RADC/28151		
92287054001	**SW-2**	EPA 904.0	RADC/28157		
92287054002	**MW-2**	EPA 904.0	RADC/28157		
92287054003	**MW-1**	EPA 904.0	RADC/28157		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92287054

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92287054004	**MW-6**	EPA 904.0	RADC/28157		
92287054005	**MW-1 DUP**	EPA 904.0	RADC/28157		
92287054006	**AMBIENT BLANK**	EPA 904.0	RADC/28157		
92287054007	**EQ BLANK**	EPA 904.0	RADC/28157		
92287054001	**SW-2**	SM 2540C	WET/43149		
92287054002	**MW-2**	SM 2540C	WET/43149		
92287054003	**MW-1**	SM 2540C	WET/43149		
92287054004	**MW-6**	SM 2540C	WET/43149		
92287054005	**MW-1 DUP**	SM 2540C	WET/43149		
92287054006	**AMBIENT BLANK**	SM 2540C	WET/43149		
92287054007	**EQ BLANK**	SM 2540C	WET/43149		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: 26OCT2015 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.17**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO# : 92287054

92287054

Courier: ☐Fed Ex ☐UPS ☐USPS ☐Client ☐Commercial ☒Pace ☐Other:

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No

Packing Material: ☐Bubble Wrap ☒Bubble Bags ☐None ☐Other:

Thermometer Used: ☒T1505 **Type of Ice:** ☒Wet ☐Blue ☐None ☐Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 2.1 C **Biological Tissue Frozen?** ☐Yes ☒No ☐N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C **Date and Initials of Person Examining Contents:** RP 2-18-16

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐Yes ☒No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐Yes ☒No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☒Yes	☐No	☐N/A	1.
Chain of Custody Filled Out?	☒Yes	☐No	☐N/A	2.
Chain of Custody Relinquished?	☒Yes	☐No	☐N/A	3.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☒Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No	☐N/A	6.
Rush Turn Around Time Requested?	☐Yes	☒No	☐N/A	7.
Sufficient Volume?	☒Yes	☐No	☐N/A	8.
Correct Containers Used?	☒Yes	☐No	☐N/A	9.
-Pace Containers Used?	☒Yes	☐No	☐N/A	
Containers Intact?	☒Yes	☐No	☐N/A	10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☒No	☐N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: Water	☒Yes	☐No	☐N/A	12.
All containers needing acid/base preservation have been checked?	☒Yes	☐No	☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☒Yes	☐No	☐N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐Yes	☒No	☐N/A	
Samples checked for dechlorization	☐Yes	☒No	☐N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐Yes	☒No	☐N/A	15.
Trip Blank Present?	✓ ☒Yes	☒No	☐N/A	16. RP 2-18-16
Trip Blank Custody Seals Present?	✓ ☒Yes	☒No	☐N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager SCURF Review: Date: 2/18/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers).

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995508

Section A Required Client Information:

Company: HDR
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To: Same
Copy To:
Purchase Order No.:
Project Name: Charah - Brickhaven
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	Metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92287054
1	SW-2		G			02/17/16	0815		11									3	2	3	1	1	1			001
2	MW-2						1110											3	2	3	1	1	1			002
3	MW-1						1345											3	2	3	1	1	1			003
4	MW-6						1755											3	2	3	1	1	1			004
5	MW-1 Dup.		G			02/17/16	1400		11									3	2	3	1	1	1			005
6	Trip Blank		G			02/17/16	0730		2											2						008
7	Ambient Blank						1600		11									3	2	3	1	1	1			006
8	EQ. Blank						1800		11									3	2	3	1	1	1			007
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	02/17/16	1845	Stan L PACE	2-18-16	0932				
	Stan L PACE	2-18-16	1331	RP Pace HVL	2-18-16	13:31	2-1	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell DATE Signed (MM/DD/YY): 02/17/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

March 16, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on February 19, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92287261001	**MW-8**	Water	02/18/16 11:10	02/19/16 15:00
92287261002	**AMBIENT BLANK**	Water	02/18/16 12:00	02/19/16 15:00
92287261003	**EQ BLANK**	Water	02/18/16 12:15	02/19/16 15:00
92287261004	**MW-7**	Water	02/18/16 08:45	02/19/16 15:00
92287261005	**TRIP BLANK**	Water	02/18/16 07:30	02/19/16 15:00

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SAMPLE ANALYTE COUNT

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92287261001	**MW-8**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92287261002	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92287261003	**EQ BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	SAM	1	PASI-A
92287261004	**MW-7**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		SM 2540C	SAM	1	PASI-A
92287261005	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92287261001	**MW-8**					
EPA 300.0	Chloride	663	mg/L	13.0	02/25/16 02:07	M6,R1
EPA 300.0	Sulfate	5.6	mg/L	1.0	02/24/16 15:35	
EPA 6010	Antimony	6.5	ug/L	5.0	02/24/16 17:44	
EPA 6010	Barium	1490	ug/L	5.0	02/23/16 23:59	
EPA 6010	Calcium	137000	ug/L	1000	02/24/16 18:40	M6
EPA 6010	Molybdenum	5.6	ug/L	5.0	02/23/16 23:59	
EPA 6010	Thallium	8.8	ug/L	5.4	02/23/16 23:59	
EPA 6010	Zinc	14.6	ug/L	10.0	02/24/16 17:44	
EPA 6020B	Boron	8.7	ug/L	5.0	02/24/16 15:33	
EPA 6020B	Lithium	33.4	ug/L	2.5	02/25/16 09:01	
EPA 903.1	Radium-226	0.116 ± 0.393 (0.758) C:NA T:90%	pCi/L		03/09/16 10:00	
EPA 904.0	Radium-228	1.11 ± 0.456 (0.732) C:85% T:83%	pCi/L		03/11/16 12:15	
SM 2540C	Total Dissolved Solids	1050	mg/L	250	02/22/16 15:56	
92287261002	**AMBIENT BLANK**					
EPA 6010	Molybdenum	5.3	ug/L	5.0	02/24/16 00:08	
EPA 6010	Thallium	10.8	ug/L	5.4	02/24/16 00:08	
EPA 903.1	Radium-226	0.156 ± 0.238 (0.382) C:NA T:98%	pCi/L		03/09/16 09:59	
EPA 904.0	Radium-228	0.0823 ± 0.285 (0.644) C:84% T:91%	pCi/L		03/11/16 12:15	
92287261003	**EQ BLANK**					
EPA 903.1	Radium-226	0.183 ± 0.494 (0.917) C:NA T:94%	pCi/L		03/09/16 10:10	
EPA 904.0	Radium-228	0.367 ± 0.313 (0.629) C:85% T:92%	pCi/L		03/11/16 12:15	
92287261004	**MW-7**					
EPA 300.0	Chloride	330	mg/L	9.0	02/25/16 04:52	
EPA 300.0	Fluoride	0.27	mg/L	0.10	02/24/16 21:12	
EPA 300.0	Sulfate	40.4	mg/L	1.0	02/24/16 21:12	
EPA 6010	Barium	254	ug/L	5.0	02/24/16 00:15	
EPA 6010	Calcium	47900	ug/L	100	02/24/16 00:15	
EPA 6010	Chromium	23.7	ug/L	5.0	02/24/16 00:15	
EPA 6010	Nickel	13.2	ug/L	5.0	02/24/16 00:15	

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SUMMARY OF DETECTION

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92287261004	**MW-7**					
EPA 6020B	Boron	35.3	ug/L	5.0	02/24/16 15:29	
EPA 6020B	Lithium	17.7	ug/L	2.5	02/25/16 09:26	
SM 2540C	Total Dissolved Solids	950	mg/L	50.0	02/22/16 15:58	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: MW-8 **Lab ID: 92287261001** Collected: 02/18/16 11:10 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**663**	mg/L	13.0	13		02/25/16 02:07	16887-00-6	M6,R1
Fluoride	ND	mg/L	0.10	1		02/24/16 15:35	16984-48-8	
Sulfate	**5.6**	mg/L	1.0	1		02/24/16 15:35	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**6.5**	ug/L	5.0	1	02/22/16 16:30	02/24/16 17:44	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:44	7440-38-2	
Barium	**1490**	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/22/16 16:30	02/23/16 23:59	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/22/16 16:30	02/23/16 23:59	7440-43-9	
Calcium	**137000**	ug/L	1000	10	02/22/16 16:30	02/24/16 18:40	7440-70-2	M6
Chromium	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-48-4	
Copper	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-50-8	
Lead	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7439-92-1	
Molybdenum	**5.6**	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/22/16 16:30	02/23/16 23:59	7782-49-2	
Silver	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-22-4	
Thallium	**8.8**	ug/L	5.4	1	02/22/16 16:30	02/23/16 23:59	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/22/16 16:30	02/23/16 23:59	7440-62-2	
Zinc	**14.6**	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:44	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**8.7**	ug/L	5.0	1	02/23/16 18:38	02/24/16 15:33	7440-42-8	
Lithium	**33.4**	ug/L	2.5	5	02/23/16 18:38	02/25/16 09:01	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/24/16 16:55	02/25/16 12:35	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/23/16 02:04	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/23/16 02:04	107-13-1	
Benzene	ND	ug/L	1.0	1		02/23/16 02:04	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/23/16 02:04	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/23/16 02:04	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/23/16 02:04	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/23/16 02:04	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/23/16 02:04	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/23/16 02:04	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/23/16 02:04	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/23/16 02:04	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/23/16 02:04	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/23/16 02:04	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/23/16 02:04	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/23/16 02:04	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: MW-8 **Lab ID: 92287261001** Collected: 02/18/16 11:10 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/23/16 02:04	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:04	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:04	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/23/16 02:04	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:04	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:04	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:04	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:04	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:04	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/23/16 02:04	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:04	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:04	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/23/16 02:04	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/23/16 02:04	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/23/16 02:04	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/23/16 02:04	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/23/16 02:04	108-10-1	
Styrene	ND	ug/L	1.0	1		02/23/16 02:04	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:04	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:04	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/23/16 02:04	127-18-4	
Toluene	ND	ug/L	1.0	1		02/23/16 02:04	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:04	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:04	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/23/16 02:04	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/23/16 02:04	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/23/16 02:04	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/23/16 02:04	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/23/16 02:04	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/23/16 02:04	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		02/23/16 02:04	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		02/23/16 02:04	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		02/23/16 02:04	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1050**	mg/L	250	1		02/22/16 15:56		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: AMBIENT BLANK **Lab ID: 92287261002** Collected: 02/18/16 12:00 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		02/24/16 16:38	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/24/16 16:38	16984-48-8	
Sulfate	ND	mg/L	1.0	1		02/24/16 16:38	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 17:52	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:52	7440-38-2	
Barium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/22/16 16:30	02/24/16 00:08	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/22/16 16:30	02/24/16 00:08	7440-43-9	
Calcium	ND	ug/L	100	1	02/22/16 16:30	02/24/16 00:08	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-48-4	
Copper	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-50-8	
Lead	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7439-92-1	
Molybdenum	**5.3**	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 00:08	7782-49-2	
Silver	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-22-4	
Thallium	**10.8**	ug/L	5.4	1	02/22/16 16:30	02/24/16 00:08	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:08	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:52	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	02/23/16 18:38	02/24/16 15:20	7440-42-8	
Lithium	ND	ug/L	0.50	1	02/23/16 18:38	02/24/16 15:20	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/24/16 16:55	02/25/16 12:38	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/23/16 02:21	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/23/16 02:21	107-13-1	
Benzene	ND	ug/L	1.0	1		02/23/16 02:21	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/23/16 02:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/23/16 02:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/23/16 02:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/23/16 02:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/23/16 02:21	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/23/16 02:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/23/16 02:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/23/16 02:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/23/16 02:21	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/23/16 02:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/23/16 02:21	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/23/16 02:21	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: AMBIENT BLANK **Lab ID: 92287261002** Collected: 02/18/16 12:00 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/23/16 02:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/23/16 02:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/23/16 02:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/23/16 02:21	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/23/16 02:21	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/23/16 02:21	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/23/16 02:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/23/16 02:21	108-10-1	
Styrene	ND	ug/L	1.0	1		02/23/16 02:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/23/16 02:21	127-18-4	
Toluene	ND	ug/L	1.0	1		02/23/16 02:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/23/16 02:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/23/16 02:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/23/16 02:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/23/16 02:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/23/16 02:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/23/16 02:21	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		02/23/16 02:21	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		02/23/16 02:21	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		02/23/16 02:21	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		02/22/16 15:57		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: EQ BLANK **Lab ID: 92287261003** Collected: 02/18/16 12:15 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		02/24/16 20:51	16887-00-6	
Fluoride	ND	mg/L	0.10	1		02/24/16 20:51	16984-48-8	
Sulfate	ND	mg/L	1.0	1		02/24/16 20:51	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 17:56	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:56	7440-38-2	
Barium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/22/16 16:30	02/24/16 00:11	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/22/16 16:30	02/24/16 00:11	7440-43-9	
Calcium	ND	ug/L	100	1	02/22/16 16:30	02/24/16 00:11	7440-70-2	
Chromium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-48-4	
Copper	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-50-8	
Lead	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7439-98-7	
Nickel	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 00:11	7782-49-2	
Silver	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/22/16 16:30	02/24/16 00:11	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:11	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:56	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	02/23/16 18:38	02/24/16 15:24	7440-42-8	
Lithium	ND	ug/L	0.50	1	02/23/16 18:38	02/24/16 15:24	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/24/16 16:55	02/25/16 12:40	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/23/16 02:37	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/23/16 02:37	107-13-1	
Benzene	ND	ug/L	1.0	1		02/23/16 02:37	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/23/16 02:37	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/23/16 02:37	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/23/16 02:37	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/23/16 02:37	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/23/16 02:37	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/23/16 02:37	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/23/16 02:37	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/23/16 02:37	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/23/16 02:37	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/23/16 02:37	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/23/16 02:37	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/23/16 02:37	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: EQ BLANK **Lab ID: 92287261003** Collected: 02/18/16 12:15 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/23/16 02:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:37	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:37	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/23/16 02:37	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:37	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:37	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:37	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/23/16 02:37	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:37	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/23/16 02:37	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/23/16 02:37	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/23/16 02:37	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/23/16 02:37	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/23/16 02:37	108-10-1	
Styrene	ND	ug/L	1.0	1		02/23/16 02:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:37	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/23/16 02:37	127-18-4	
Toluene	ND	ug/L	1.0	1		02/23/16 02:37	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:37	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/23/16 02:37	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/23/16 02:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/23/16 02:37	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/23/16 02:37	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/23/16 02:37	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/23/16 02:37	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		02/23/16 02:37	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		02/23/16 02:37	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		02/23/16 02:37	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		02/22/16 15:57		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: MW-7 **Lab ID: 92287261004** Collected: 02/18/16 08:45 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**330**	mg/L	9.0	9		02/25/16 04:52	16887-00-6	
Fluoride	**0.27**	mg/L	0.10	1		02/24/16 21:12	16984-48-8	
Sulfate	**40.4**	mg/L	1.0	1		02/24/16 21:12	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 17:59	7440-36-0	
Arsenic	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:59	7440-38-2	
Barium	**254**	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-39-3	
Beryllium	ND	ug/L	1.0	1	02/22/16 16:30	02/24/16 00:15	7440-41-7	
Cadmium	ND	ug/L	1.0	1	02/22/16 16:30	02/24/16 00:15	7440-43-9	
Calcium	**47900**	ug/L	100	1	02/22/16 16:30	02/24/16 00:15	7440-70-2	
Chromium	**23.7**	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-47-3	
Cobalt	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-48-4	
Copper	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-50-8	
Lead	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7439-98-7	
Nickel	**13.2**	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-02-0	
Selenium	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 00:15	7782-49-2	
Silver	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-22-4	
Thallium	ND	ug/L	5.4	1	02/22/16 16:30	02/24/16 00:15	7440-28-0	
Vanadium	ND	ug/L	5.0	1	02/22/16 16:30	02/24/16 00:15	7440-62-2	
Zinc	ND	ug/L	10.0	1	02/22/16 16:30	02/24/16 17:59	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**35.3**	ug/L	5.0	1	02/23/16 18:38	02/24/16 15:29	7440-42-8	
Lithium	**17.7**	ug/L	2.5	5	02/23/16 18:38	02/25/16 09:26	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/24/16 16:55	02/25/16 12:42	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/23/16 02:54	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/23/16 02:54	107-13-1	
Benzene	ND	ug/L	1.0	1		02/23/16 02:54	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/23/16 02:54	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/23/16 02:54	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/23/16 02:54	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/23/16 02:54	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/23/16 02:54	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/23/16 02:54	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/23/16 02:54	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/23/16 02:54	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/23/16 02:54	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/23/16 02:54	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/23/16 02:54	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/23/16 02:54	124-48-1	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: MW-7 **Lab ID: 92287261004** Collected: 02/18/16 08:45 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		02/23/16 02:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:54	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 02:54	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/23/16 02:54	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/23/16 02:54	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 02:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/23/16 02:54	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 02:54	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/23/16 02:54	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/23/16 02:54	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/23/16 02:54	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/23/16 02:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/23/16 02:54	108-10-1	
Styrene	ND	ug/L	1.0	1		02/23/16 02:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 02:54	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/23/16 02:54	127-18-4	
Toluene	ND	ug/L	1.0	1		02/23/16 02:54	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/23/16 02:54	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/23/16 02:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/23/16 02:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/23/16 02:54	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/23/16 02:54	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/23/16 02:54	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/23/16 02:54	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		02/23/16 02:54	460-00-4	
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		02/23/16 02:54	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		02/23/16 02:54	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**950**	mg/L	50.0	1		02/22/16 15:58		

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: TRIP BLANK **Lab ID: 92287261005** Collected: 02/18/16 07:30 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		02/23/16 03:11	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		02/23/16 03:11	107-13-1	
Benzene	ND	ug/L	1.0	1		02/23/16 03:11	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		02/23/16 03:11	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		02/23/16 03:11	75-27-4	
Bromoform	ND	ug/L	1.0	1		02/23/16 03:11	75-25-2	
Bromomethane	ND	ug/L	2.0	1		02/23/16 03:11	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		02/23/16 03:11	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		02/23/16 03:11	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		02/23/16 03:11	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		02/23/16 03:11	108-90-7	
Chloroethane	ND	ug/L	1.0	1		02/23/16 03:11	75-00-3	
Chloroform	ND	ug/L	1.0	1		02/23/16 03:11	67-66-3	
Chloromethane	ND	ug/L	1.0	1		02/23/16 03:11	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		02/23/16 03:11	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		02/23/16 03:11	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 03:11	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		02/23/16 03:11	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		02/23/16 03:11	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		02/23/16 03:11	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		02/23/16 03:11	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		02/23/16 03:11	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 03:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		02/23/16 03:11	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		02/23/16 03:11	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 03:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		02/23/16 03:11	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		02/23/16 03:11	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		02/23/16 03:11	591-78-6	
Iodomethane	ND	ug/L	5.0	1		02/23/16 03:11	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		02/23/16 03:11	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		02/23/16 03:11	108-10-1	
Styrene	ND	ug/L	1.0	1		02/23/16 03:11	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 03:11	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		02/23/16 03:11	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		02/23/16 03:11	127-18-4	
Toluene	ND	ug/L	1.0	1		02/23/16 03:11	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		02/23/16 03:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		02/23/16 03:11	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		02/23/16 03:11	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		02/23/16 03:11	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		02/23/16 03:11	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		02/23/16 03:11	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		02/23/16 03:11	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		02/23/16 03:11	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		02/23/16 03:11	460-00-4	

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ANALYTICAL RESULTS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: TRIP BLANK **Lab ID: 92287261005** Collected: 02/18/16 07:30 Received: 02/19/16 15:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	93	%	70-130	1		02/23/16 03:11	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		02/23/16 03:11	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: GWD/2902 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

METHOD BLANK: 1672124 — Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	02/24/16 14:53	
Fluoride	mg/L	ND	0.10	02/24/16 14:53	
Sulfate	mg/L	ND	1.0	02/24/16 14:53	

LABORATORY CONTROL SAMPLE: 1672125

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	47.9	96	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	50	47.0	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1672126 1672127

Parameter	Units	92287261001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	663	50	50	522	704	-282	83	90-110	30	20	M6,R1
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	93	95	90-110	2	20	
Sulfate	mg/L	5.6	50	50	55.4	55.9	100	101	90-110	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: MERP/8993 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

METHOD BLANK: 1672115 Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	02/25/16 11:55	

LABORATORY CONTROL SAMPLE: 1672116

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1672117 1672118

Parameter	Units	92287006001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.2	93	84	75-125	10	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: MPRP/20757 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

METHOD BLANK: 1670852 Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	02/24/16 17:37	
Arsenic	ug/L	ND	10.0	02/24/16 17:37	
Barium	ug/L	ND	5.0	02/23/16 23:44	
Beryllium	ug/L	ND	1.0	02/23/16 23:44	
Cadmium	ug/L	ND	1.0	02/23/16 23:44	
Calcium	ug/L	ND	100	02/23/16 23:44	
Chromium	ug/L	ND	5.0	02/23/16 23:44	
Cobalt	ug/L	ND	5.0	02/23/16 23:44	
Copper	ug/L	ND	5.0	02/23/16 23:44	
Lead	ug/L	ND	5.0	02/23/16 23:44	
Molybdenum	ug/L	ND	5.0	02/23/16 23:44	
Nickel	ug/L	ND	5.0	02/23/16 23:44	
Selenium	ug/L	ND	10.0	02/23/16 23:44	
Silver	ug/L	ND	5.0	02/23/16 23:44	
Thallium	ug/L	ND	5.4	02/23/16 23:44	
Vanadium	ug/L	ND	5.0	02/23/16 23:44	
Zinc	ug/L	ND	10.0	02/24/16 17:37	

LABORATORY CONTROL SAMPLE: 1670853

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	439	88	80-120	
Arsenic	ug/L	500	498	100	80-120	
Barium	ug/L	500	547	109	80-120	
Beryllium	ug/L	500	527	105	80-120	
Cadmium	ug/L	500	490	98	80-120	
Calcium	ug/L	5000	5670	113	80-120	
Chromium	ug/L	500	504	101	80-120	
Cobalt	ug/L	500	469	94	80-120	
Copper	ug/L	500	498	100	80-120	
Lead	ug/L	500	472	94	80-120	
Molybdenum	ug/L	500	444	89	80-120	
Nickel	ug/L	500	491	98	80-120	
Selenium	ug/L	500	471	94	80-120	
Silver	ug/L	250	214	86	80-120	
Thallium	ug/L	500	490	98	80-120	
Vanadium	ug/L	500	520	104	80-120	
Zinc	ug/L	500	490	98	80-120	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1670854 1670855

Parameter	Units	92287261001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	6.5	500	500	445	447	88	88	75-125	0	25	
Arsenic	ug/L	ND	500	500	502	508	100	101	75-125	1	25	
Barium	ug/L	1490	500	500	1920	1920	87	87	75-125	0	25	
Beryllium	ug/L	ND	500	500	502	503	100	101	75-125	0	25	
Cadmium	ug/L	ND	500	500	462	459	92	92	75-125	0	25	
Calcium	ug/L	137000	5000	5000	146000	151000	174	286	75-125	4	25	M6
Chromium	ug/L	ND	500	500	475	478	94	95	75-125	1	25	
Cobalt	ug/L	ND	500	500	415	412	83	82	75-125	1	25	
Copper	ug/L	ND	500	500	472	471	94	94	75-125	0	25	
Lead	ug/L	ND	500	500	418	415	84	83	75-125	1	25	
Molybdenum	ug/L	5.6	500	500	417	422	82	83	75-125	1	25	
Nickel	ug/L	ND	500	500	433	432	86	86	75-125	0	25	
Selenium	ug/L	ND	500	500	435	431	87	86	75-125	1	25	
Silver	ug/L	ND	250	250	206	207	82	82	75-125	0	25	
Thallium	ug/L	8.8	500	500	429	438	84	86	75-125	2	25	
Vanadium	ug/L	ND	500	500	497	501	99	100	75-125	1	25	
Zinc	ug/L	14.6	500	500	482	485	93	94	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: MPRP/61593 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

METHOD BLANK: 2197081 Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/24/16 11:32	
Lithium	ug/L	ND	0.50	02/24/16 11:32	

LABORATORY CONTROL SAMPLE: 2197082

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	79.8	100	80-120	
Lithium	ug/L	80	83.1	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2197083 2197084

Parameter	Units	92287261001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	8.7	80	80	94.9	91.3	108	103	75-125	4	20	
Lithium	ug/L	33.4	80	80	117	116	105	103	75-125	1	20	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: MSV/35665 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004, 92287261005

METHOD BLANK: 1670820 Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004, 92287261005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	02/23/16 01:48	
1,1,1-Trichloroethane	ug/L	ND	1.0	02/23/16 01:48	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	02/23/16 01:48	
1,1,2-Trichloroethane	ug/L	ND	1.0	02/23/16 01:48	
1,1-Dichloroethane	ug/L	ND	1.0	02/23/16 01:48	
1,1-Dichloroethene	ug/L	ND	1.0	02/23/16 01:48	
1,2,3-Trichloropropane	ug/L	ND	1.0	02/23/16 01:48	
1,2-Dichlorobenzene	ug/L	ND	1.0	02/23/16 01:48	
1,2-Dichloroethane	ug/L	ND	1.0	02/23/16 01:48	
1,2-Dichloropropane	ug/L	ND	1.0	02/23/16 01:48	
1,4-Dichlorobenzene	ug/L	ND	1.0	02/23/16 01:48	
2-Butanone (MEK)	ug/L	ND	5.0	02/23/16 01:48	
2-Hexanone	ug/L	ND	5.0	02/23/16 01:48	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	02/23/16 01:48	
Acetone	ug/L	ND	25.0	02/23/16 01:48	
Acrylonitrile	ug/L	ND	10.0	02/23/16 01:48	
Benzene	ug/L	ND	1.0	02/23/16 01:48	
Bromochloromethane	ug/L	ND	1.0	02/23/16 01:48	
Bromodichloromethane	ug/L	ND	1.0	02/23/16 01:48	
Bromoform	ug/L	ND	1.0	02/23/16 01:48	
Bromomethane	ug/L	ND	2.0	02/23/16 01:48	
Carbon disulfide	ug/L	ND	2.0	02/23/16 01:48	
Carbon tetrachloride	ug/L	ND	1.0	02/23/16 01:48	
Chlorobenzene	ug/L	ND	1.0	02/23/16 01:48	
Chloroethane	ug/L	ND	1.0	02/23/16 01:48	
Chloroform	ug/L	ND	1.0	02/23/16 01:48	
Chloromethane	ug/L	ND	1.0	02/23/16 01:48	
cis-1,2-Dichloroethene	ug/L	ND	1.0	02/23/16 01:48	
cis-1,3-Dichloropropene	ug/L	ND	1.0	02/23/16 01:48	
Dibromochloromethane	ug/L	ND	1.0	02/23/16 01:48	
Dibromomethane	ug/L	ND	1.0	02/23/16 01:48	
Ethylbenzene	ug/L	ND	1.0	02/23/16 01:48	
Iodomethane	ug/L	ND	5.0	02/23/16 01:48	
Methylene Chloride	ug/L	ND	1.0	02/23/16 01:48	
Styrene	ug/L	ND	1.0	02/23/16 01:48	
Tetrachloroethene	ug/L	ND	1.0	02/23/16 01:48	
Toluene	ug/L	ND	1.0	02/23/16 01:48	
trans-1,2-Dichloroethene	ug/L	ND	1.0	02/23/16 01:48	
trans-1,3-Dichloropropene	ug/L	ND	1.0	02/23/16 01:48	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	02/23/16 01:48	
Trichloroethene	ug/L	ND	1.0	02/23/16 01:48	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

METHOD BLANK: 1670820 Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004, 92287261005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	02/23/16 01:48	
Vinyl acetate	ug/L	ND	2.0	02/23/16 01:48	
Vinyl chloride	ug/L	ND	1.0	02/23/16 01:48	
Xylene (Total)	ug/L	ND	2.0	02/23/16 01:48	
1,2-Dichloroethane-d4 (S)	%	90	70-130	02/23/16 01:48	
4-Bromofluorobenzene (S)	%	99	70-130	02/23/16 01:48	
Toluene-d8 (S)	%	101	70-130	02/23/16 01:48	

LABORATORY CONTROL SAMPLE: 1670821

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.1	98	80-125	
1,1,1-Trichloroethane	ug/L	50	47.3	95	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	47.5	95	79-124	
1,1,2-Trichloroethane	ug/L	50	47.8	96	85-125	
1,1-Dichloroethane	ug/L	50	45.1	90	73-126	
1,1-Dichloroethene	ug/L	50	48.6	97	66-135	
1,2,3-Trichloropropane	ug/L	50	47.4	95	75-130	
1,2-Dichlorobenzene	ug/L	50	46.7	93	80-133	
1,2-Dichloroethane	ug/L	50	43.2	86	67-128	
1,2-Dichloropropane	ug/L	50	46.8	94	75-132	
1,4-Dichlorobenzene	ug/L	50	48.0	96	78-130	
2-Butanone (MEK)	ug/L	100	88.3	88	61-144	
2-Hexanone	ug/L	100	92.7	93	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	94.2	94	72-135	
Acetone	ug/L	100	83.6	84	48-146	
Acrylonitrile	ug/L	250	237	95	40-160	
Benzene	ug/L	50	47.5	95	80-125	
Bromochloromethane	ug/L	50	49.0	98	71-125	
Bromodichloromethane	ug/L	50	48.8	98	78-124	
Bromoform	ug/L	50	51.2	102	71-128	
Bromomethane	ug/L	50	35.3	71	40-160	
Carbon disulfide	ug/L	50	51.0	102	50-160	
Carbon tetrachloride	ug/L	50	49.0	98	69-131	
Chlorobenzene	ug/L	50	47.1	94	81-122	
Chloroethane	ug/L	50	40.0	80	39-148	
Chloroform	ug/L	50	46.2	92	73-127	
Chloromethane	ug/L	50	37.1	74	44-146	
cis-1,2-Dichloroethene	ug/L	50	45.5	91	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.0	100	72-132	
Dibromochloromethane	ug/L	50	50.4	101	78-125	
Dibromomethane	ug/L	50	51.0	102	82-120	
Ethylbenzene	ug/L	50	45.4	91	79-121	
Iodomethane	ug/L	100	86.2	86	39-154	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

LABORATORY CONTROL SAMPLE: 1670821

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	47.2	94	64-133	
Styrene	ug/L	50	47.4	95	84-126	
Tetrachloroethene	ug/L	50	46.5	93	78-122	
Toluene	ug/L	50	47.1	94	80-121	
trans-1,2-Dichloroethene	ug/L	50	46.6	93	71-127	
trans-1,3-Dichloropropene	ug/L	50	49.8	100	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	46.8	94	40-160	
Trichloroethene	ug/L	50	48.3	97	78-122	
Trichlorofluoromethane	ug/L	50	46.2	92	53-137	
Vinyl acetate	ug/L	100	92.6	93	40-160	
Vinyl chloride	ug/L	50	47.0	94	58-137	
Xylene (Total)	ug/L	150	135	90	81-126	
1,2-Dichloroethane-d4 (S)	%			93	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE SAMPLE: 1670822

Parameter	Units	92287200001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.7	99	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	20.3	101	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	17.9	90	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.1	95	70-130	
1,1-Dichloroethane	ug/L	ND	20	19.0	95	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.0	105	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	18.9	94	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	18.6	93	70-130	
1,2-Dichloroethane	ug/L	ND	20	17.1	86	70-130	
1,2-Dichloropropane	ug/L	ND	20	19.3	96	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	19.0	95	70-130	
2-Butanone (MEK)	ug/L	ND	40	31.7	79	70-130	
2-Hexanone	ug/L	ND	40	35.7	89	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	36.7	92	70-130	
Acetone	ug/L	ND	40	34.2	85	70-130	
Acrylonitrile	ug/L	ND	100	84.6	85	70-130	
Benzene	ug/L	ND	20	20.4	102	70-148	
Bromochloromethane	ug/L	ND	20	19.4	97	70-130	
Bromodichloromethane	ug/L	ND	20	20.3	102	70-130	
Bromoform	ug/L	ND	20	18.1	91	70-130	
Bromomethane	ug/L	ND	20	13.3	67	70-130	M1
Carbon disulfide	ug/L	ND	20	21.7	108	70-130	
Carbon tetrachloride	ug/L	ND	20	21.1	105	70-130	
Chlorobenzene	ug/L	ND	20	19.5	97	70-146	
Chloroethane	ug/L	ND	20	19.2	96	70-130	
Chloroform	ug/L	ND	20	19.3	96	70-130	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

MATRIX SPIKE SAMPLE: 1670822

Parameter	Units	92287200001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	16.3	81	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	19.1	96	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.4	97	70-130	
Dibromochloromethane	ug/L	ND	20	19.5	97	70-130	
Dibromomethane	ug/L	ND	20	20.9	104	70-130	
Ethylbenzene	ug/L	ND	20	19.1	96	70-130	
Iodomethane	ug/L	ND	40	23.6	59	70-130	M1
Methylene Chloride	ug/L	ND	20	17.3	86	70-130	
Styrene	ug/L	ND	20	18.7	94	70-130	
Tetrachloroethene	ug/L	ND	20	20.0	100	70-130	
Toluene	ug/L	ND	20	19.9	100	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	19.6	98	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.9	95	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	13.3	66	70-130	M1
Trichloroethene	ug/L	ND	20	20.3	102	69-151	
Trichlorofluoromethane	ug/L	ND	20	20.3	101	70-130	
Vinyl acetate	ug/L	ND	40	25.5	64	70-130	M1
Vinyl chloride	ug/L	ND	20	20.3	102	70-130	
1,2-Dichloroethane-d4 (S)	%				91	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1670823

Parameter	Units	92287200002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

SAMPLE DUPLICATE: 1670823

Parameter	Units	92287200002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	91	92	1		
4-Bromofluorobenzene (S)	%	100	103	3		
Toluene-d8 (S)	%	100	102	2		

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QUALITY CONTROL DATA

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: WET/43175 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

METHOD BLANK: 1670521 Matrix: Water
Associated Lab Samples: 92287261001, 92287261002, 92287261003, 92287261004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	02/22/16 15:48	

LABORATORY CONTROL SAMPLE: 1670522

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	244	98	90-110	

SAMPLE DUPLICATE: 1670523

Parameter	Units	92287225001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 1670524

Parameter	Units	92287230005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	140000 ug/L	138	1	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: MW-8 **Lab ID: 92287261001** Collected: 02/18/16 11:10 Received: 02/19/16 15:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.116 ± 0.393 (0.758)** **C:NA T:90%**	pCi/L	03/09/16 10:00	13982-63-3	
Radium-228	EPA 904.0	**1.11 ± 0.456 (0.732)** **C:85% T:83%**	pCi/L	03/11/16 12:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: AMBIENT BLANK **Lab ID: 92287261002** Collected: 02/18/16 12:00 Received: 02/19/16 15:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.156 ± 0.238 (0.382)** **C:NA T:98%**	pCi/L	03/09/16 09:59	13982-63-3	
Radium-228	EPA 904.0	**0.0823 ± 0.285 (0.644)** **C:84% T:91%**	pCi/L	03/11/16 12:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Sample: EQ BLANK **Lab ID: 92287261003** Collected: 02/18/16 12:15 Received: 02/19/16 15:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.183 ± 0.494 (0.917) C:NA T:94%**	pCi/L	03/09/16 10:10	13982-63-3	
Radium-228	EPA 904.0	**0.367 ± 0.313 (0.629) C:85% T:92%**	pCi/L	03/11/16 12:15	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: RADC/28153 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92287261001, 92287261002, 92287261003

METHOD BLANK: 1030491 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0506 ± 0.298 (0.608) C:NA T:100%	pCi/L	03/09/16 10:10	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

QC Batch: RADC/28159 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92287261001, 92287261002, 92287261003

METHOD BLANK: 1030497 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.379 ± 0.352 (0.722) C:87% T:85%	pCi/L	03/11/16 12:15	

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QUALIFIERS

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH - BRICKHAVEN
Pace Project No.: 92287261

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92287261001	**MW-8**	EPA 300.0	GWD/2902		
92287261002	**AMBIENT BLANK**	EPA 300.0	GWD/2902		
92287261003	**EQ BLANK**	EPA 300.0	GWD/2902		
92287261004	**MW-7**	EPA 300.0	GWD/2902		
92287261001	**MW-8**	EPA 3010A	MPRP/20757	EPA 6010	ICP/18710
92287261002	**AMBIENT BLANK**	EPA 3010A	MPRP/20757	EPA 6010	ICP/18710
92287261003	**EQ BLANK**	EPA 3010A	MPRP/20757	EPA 6010	ICP/18710
92287261004	**MW-7**	EPA 3010A	MPRP/20757	EPA 6010	ICP/18710
92287261001	**MW-8**	EPA 3020	MPRP/61593	EPA 6020B	ICPM/28436
92287261002	**AMBIENT BLANK**	EPA 3020	MPRP/61593	EPA 6020B	ICPM/28436
92287261003	**EQ BLANK**	EPA 3020	MPRP/61593	EPA 6020B	ICPM/28436
92287261004	**MW-7**	EPA 3020	MPRP/61593	EPA 6020B	ICPM/28436
92287261001	**MW-8**	EPA 7470	MERP/8993	EPA 7470	MERC/8643
92287261002	**AMBIENT BLANK**	EPA 7470	MERP/8993	EPA 7470	MERC/8643
92287261003	**EQ BLANK**	EPA 7470	MERP/8993	EPA 7470	MERC/8643
92287261004	**MW-7**	EPA 7470	MERP/8993	EPA 7470	MERC/8643
92287261001	**MW-8**	EPA 8260	MSV/35665		
92287261002	**AMBIENT BLANK**	EPA 8260	MSV/35665		
92287261003	**EQ BLANK**	EPA 8260	MSV/35665		
92287261004	**MW-7**	EPA 8260	MSV/35665		
92287261005	**TRIP BLANK**	EPA 8260	MSV/35665		
92287261001	**MW-8**	EPA 903.1	RADC/28153		
92287261002	**AMBIENT BLANK**	EPA 903.1	RADC/28153		
92287261003	**EQ BLANK**	EPA 903.1	RADC/28153		
92287261001	**MW-8**	EPA 904.0	RADC/28159		
92287261002	**AMBIENT BLANK**	EPA 904.0	RADC/28159		
92287261003	**EQ BLANK**	EPA 904.0	RADC/28159		
92287261001	**MW-8**	SM 2540C	WET/43175		
92287261002	**AMBIENT BLANK**	SM 2540C	WET/43175		
92287261003	**EQ BLANK**	SM 2540C	WET/43175		
92287261004	**MW-7**	SM 2540C	WET/43175		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised: 26OCT2015 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.17**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO# : 92287261

92287261

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other:

Thermometer Used: ☑ T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Cooler Temp Corrected (°C): 2.9 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0.0 °C **Date and Initials of Person Examining Contents:** TH 2-19-16

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

If Yes to either question, fill out a Regulated Soil Checklist and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☑ No	☐ N/A	9. VG9U used for line 2 (8260
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☑ Yes	☐ No	☐ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	
Samples checked for dechlorization	☐ Yes	☐ No	☑ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager SCURF Review: **Date:** 2-19-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995509

Section A Required Client Information:

Company:	HDR
Address:	
Email To:	
Phone: / Fax:	
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Same
Copy To:	
Purchase Order No.:	
Project Name:	Charah - Brickhaven
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	Metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92287261
1	MW-8		G			02/18/16	1110		11									3	2	3	1	1	1		001
2	MW-7		G			02/18/16	0845		8										2	3	1	1	1			004
3																									
4	Trip Blank		G			02/18/16	0730		2											2						005
5	Ambient Blank		G			02/18/16	1200		11									3	2	3	1	1	1			002
6	EQ. Blank		G			02/18/16	1215		11									3	2	3	1	1	1			003
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	02/18/16	1330	~~[illegible] Pace HM~~	~~2-18-16~~	~~1330~~	~~2.9~~	~~Y~~	~~N~~	~~Y~~
				[illegible]	2/19/16	945				
	[illegible] Pace	2/19/16	1500	[illegible] Pace HM	2-19-16	1500	2.9	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 02/18/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

May 02, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on April 06, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92292667001	**SW-2**	Water	04/05/16 09:40	04/06/16 10:15
92292667002	**SW-1**	Water	04/05/16 10:20	04/06/16 10:15
92292667003	**BG-1**	Water	04/05/16 11:20	04/06/16 10:15
92292667004	**MW-5**	Water	04/05/16 12:20	04/06/16 10:15
92292667005	**LEACHATE-1**	Water	04/05/16 14:10	04/06/16 10:15
92292667006	**MW-6**	Water	04/05/16 16:15	04/06/16 10:15
92292667007	**AMBIENT BLANK**	Water	04/05/16 11:30	04/06/16 10:15
92292667008	**EQ. BLANK**	Water	04/05/16 18:00	04/06/16 10:15
92292667009	**TRIP BLANK**	Water	04/05/16 07:00	04/06/16 10:15

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SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92292667001	**SW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667002	**SW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667003	**BG-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667004	**MW-5**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667005	**LEACHATE-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C

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Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667006	**MW-6**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667007	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667008	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292667009	**TRIP BLANK**	EPA 8260	CCL	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92292667001	**SW-2**					
EPA 300.0	Chloride	13.7	mg/L	1.0	04/12/16 12:58	
EPA 300.0	Sulfate	5.5	mg/L	1.0	04/12/16 12:58	
EPA 6010	Barium	53.0	ug/L	5.0	04/12/16 01:54	
EPA 6010	Calcium	7800	ug/L	100	04/12/16 01:54	
EPA 6010	Zinc	14.2	ug/L	10.0	04/12/16 01:54	
EPA 6020B	Boron	34.4	ug/L	5.0	04/11/16 15:30	
EPA 6020B	Lithium	1.1	ug/L	0.50	04/12/16 10:58	
EPA 8260	Toluene	13.7	ug/L	1.0	04/09/16 13:27	
EPA 903.1	Radium-226	-0.133 ± 0.304 (0.716) C:NA T:92%	pCi/L		05/02/16 10:28	
EPA 904.0	Radium-228	0.397 ± 0.409 (0.849) C:82% T:73%	pCi/L		04/29/16 14:45	
SM 2540C	Total Dissolved Solids	121	mg/L	25.0	04/07/16 17:18	
92292667002	**SW-1**					
EPA 300.0	Chloride	11.9	mg/L	1.0	04/12/16 14:04	
EPA 300.0	Fluoride	0.10	mg/L	0.10	04/12/16 14:04	
EPA 300.0	Sulfate	3.5	mg/L	1.0	04/12/16 14:04	
EPA 6010	Barium	59.8	ug/L	5.0	04/12/16 02:06	
EPA 6010	Calcium	2880	ug/L	100	04/12/16 02:06	
EPA 6020B	Boron	11.2	ug/L	5.0	04/11/16 15:44	
EPA 6020B	Lithium	1.5	ug/L	0.50	04/12/16 11:12	
EPA 903.1	Radium-226	0.499 ± 0.507 (0.767) C:NA T:91%	pCi/L		05/02/16 10:29	
EPA 904.0	Radium-228	0.761 ± 0.424 (0.772) C:82% T:81%	pCi/L		04/29/16 14:45	
SM 2540C	Total Dissolved Solids	94.0	mg/L	25.0	04/07/16 17:19	
92292667003	**BG-1**					
EPA 300.0	Chloride	264	mg/L	5.0	04/13/16 04:45	
EPA 300.0	Fluoride	0.13	mg/L	0.10	04/12/16 14:26	
EPA 300.0	Sulfate	19.6	mg/L	1.0	04/12/16 14:26	
EPA 6010	Barium	302	ug/L	5.0	04/12/16 02:09	
EPA 6010	Calcium	27300	ug/L	100	04/12/16 02:09	
EPA 6020B	Boron	6.0	ug/L	5.0	04/11/16 15:47	
EPA 6020B	Lithium	36.8	ug/L	2.5	04/12/16 11:15	
EPA 903.1	Radium-226	0.407 ± 0.423 (0.630) C:NA T:92%	pCi/L		05/02/16 10:28	

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Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92292667003	**BG-1**					
EPA 904.0	Radium-228	0.828 ± 0.409 (0.714) C:82% T:87%	pCi/L		04/29/16 14:45	
SM 2540C	Total Dissolved Solids	628	mg/L	25.0	04/07/16 17:19	
92292667004	**MW-5**					
EPA 300.0	Chloride	18.0	mg/L	1.0	04/12/16 14:48	
EPA 300.0	Fluoride	0.52	mg/L	0.10	04/12/16 14:48	
EPA 300.0	Sulfate	3.1	mg/L	1.0	04/12/16 14:48	
EPA 6010	Barium	91.4	ug/L	5.0	04/12/16 02:13	
EPA 6010	Calcium	10100	ug/L	100	04/12/16 02:13	
EPA 6010	Zinc	36.1	ug/L	10.0	04/12/16 02:13	
EPA 6020B	Boron	12.1	ug/L	5.0	04/11/16 15:50	
EPA 6020B	Lithium	9.7	ug/L	2.5	04/12/16 11:21	
EPA 903.1	Radium-226	0.000 ± 0.310 (0.632) C:NA T:93%	pCi/L		05/02/16 10:32	
EPA 904.0	Radium-228	0.951 ± 0.430 (0.731) C:83% T:90%	pCi/L		04/29/16 14:45	
SM 2540C	Total Dissolved Solids	194	mg/L	25.0	04/07/16 17:20	
92292667005	**LEACHATE-1**					
EPA 300.0	Chloride	239	mg/L	5.0	04/13/16 05:14	
EPA 300.0	Fluoride	0.34	mg/L	0.10	04/12/16 15:10	
EPA 300.0	Sulfate	94.5	mg/L	1.0	04/12/16 15:10	
EPA 6010	Antimony	10.7	ug/L	5.0	04/12/16 02:16	
EPA 6010	Arsenic	11.6	ug/L	10.0	04/12/16 02:16	
EPA 6010	Barium	177	ug/L	5.0	04/12/16 02:16	
EPA 6010	Calcium	102000	ug/L	500	04/12/16 16:31	
EPA 6010	Chromium	8.6	ug/L	5.0	04/12/16 02:16	
EPA 6010	Molybdenum	133	ug/L	5.0	04/12/16 02:16	
EPA 6010	Selenium	246	ug/L	10.0	04/12/16 02:16	
EPA 6010	Vanadium	27.6	ug/L	5.0	04/12/16 02:16	
EPA 6020B	Boron	690	ug/L	25.0	04/12/16 11:30	
EPA 6020B	Lithium	40.0	ug/L	2.5	04/12/16 11:30	
EPA 903.1	Radium-226	0.283 ± 0.440 (0.761) C:NA T:91%	pCi/L		05/02/16 10:41	
EPA 904.0	Radium-228	0.742 ± 0.408 (0.740) C:82% T:85%	pCi/L		04/29/16 14:45	
SM 2540C	Total Dissolved Solids	516	mg/L	25.0	04/07/16 17:20	

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SUMMARY OF DETECTION

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92292667006	**MW-6**					
EPA 300.0	Chloride	15.3	mg/L	1.0	04/12/16 15:32	
EPA 300.0	Fluoride	0.18	mg/L	0.10	04/12/16 15:32	
EPA 300.0	Sulfate	214	mg/L	4.0	04/13/16 05:42	
EPA 6010	Barium	108	ug/L	5.0	04/12/16 02:19	
EPA 6010	Calcium	33600	ug/L	100	04/12/16 02:19	
EPA 6020B	Boron	10.8	ug/L	5.0	04/11/16 16:01	
EPA 6020B	Lithium	41.2	ug/L	2.5	04/12/16 11:33	
EPA 903.1	Radium-226	-0.068 ± 0.310 (0.730) C:NA T:93%	pCi/L		05/02/16 10:41	
EPA 904.0	Radium-228	0.912 ± 0.437 (0.747) C:81% T:79%	pCi/L		04/29/16 14:45	
SM 2540C	Total Dissolved Solids	689	mg/L	25.0	04/07/16 17:20	
92292667007	**AMBIENT BLANK**					
EPA 903.1	Radium-226	0.192 ± 0.294 (0.472) C:NA T:97%	pCi/L		05/02/16 10:42	
EPA 904.0	Radium-228	0.603 ± 0.369 (0.693) C:82% T:89%	pCi/L		04/29/16 14:46	
92292667008	**EQ. BLANK**					
EPA 6010	Zinc	10.5	ug/L	10.0	04/12/16 02:25	
EPA 903.1	Radium-226	0.212 ± 0.323 (0.191) C:NA T:90%	pCi/L		05/02/16 10:52	
EPA 904.0	Radium-228	0.512 ± 0.370 (0.725) C:83% T:86%	pCi/L		04/29/16 14:46	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: SW-2 **Lab ID: 92292667001** Collected: 04/05/16 09:40 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**13.7**	mg/L	1.0	1		04/12/16 12:58	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 12:58	16984-48-8	
Sulfate	**5.5**	mg/L	1.0	1		04/12/16 12:58	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 01:54	7440-38-2	
Barium	**53.0**	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 01:54	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 01:54	7440-43-9	
Calcium	**7800**	ug/L	100	1	04/08/16 15:10	04/12/16 01:54	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 01:54	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 01:54	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 01:54	7440-62-2	
Zinc	**14.2**	ug/L	10.0	1	04/08/16 15:10	04/12/16 01:54	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**34.4**	ug/L	5.0	1	04/08/16 11:47	04/11/16 15:30	7440-42-8	
Lithium	**1.1**	ug/L	0.50	1	04/08/16 11:47	04/12/16 10:58	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:29	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 13:27	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 13:27	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 13:27	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 13:27	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 13:27	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 13:27	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 13:27	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 13:27	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 13:27	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 13:27	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 13:27	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 13:27	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 13:27	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 13:27	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 13:27	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: SW-2 **Lab ID: 92292667001** Collected: 04/05/16 09:40 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 13:27	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 13:27	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 13:27	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 13:27	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 13:27	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 13:27	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 13:27	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 13:27	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 13:27	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 13:27	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 13:27	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 13:27	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 13:27	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 13:27	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 13:27	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 13:27	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 13:27	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 13:27	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 13:27	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 13:27	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 13:27	127-18-4	
Toluene	**13.7**	ug/L	1.0	1		04/09/16 13:27	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 13:27	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 13:27	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 13:27	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 13:27	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 13:27	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 13:27	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 13:27	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 13:27	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		04/09/16 13:27	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		04/09/16 13:27	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 13:27	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**121**	mg/L	25.0	1		04/07/16 17:18		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: SW-1 **Lab ID: 92292667002** Collected: 04/05/16 10:20 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**11.9**	mg/L	1.0	1		04/12/16 14:04	16887-00-6	
Fluoride	**0.10**	mg/L	0.10	1		04/12/16 14:04	16984-48-8	
Sulfate	**3.5**	mg/L	1.0	1		04/12/16 14:04	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:06	7440-38-2	
Barium	**59.8**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:06	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:06	7440-43-9	
Calcium	**2880**	ug/L	100	1	04/08/16 15:10	04/12/16 02:06	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:06	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:06	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:06	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:06	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**11.2**	ug/L	5.0	1	04/08/16 11:47	04/11/16 15:44	7440-42-8	
Lithium	**1.5**	ug/L	0.50	1	04/08/16 11:47	04/12/16 11:12	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:31	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 12:36	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 12:36	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 12:36	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 12:36	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 12:36	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 12:36	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 12:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 12:36	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 12:36	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 12:36	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 12:36	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 12:36	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 12:36	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 12:36	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 12:36	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: SW-1 **Lab ID: 92292667002** Collected: 04/05/16 10:20 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 12:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 12:36	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 12:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 12:36	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 12:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 12:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 12:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 12:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 12:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 12:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 12:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 12:36	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 12:36	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 12:36	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 12:36	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 12:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 12:36	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 12:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 12:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 12:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 12:36	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 12:36	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 12:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 12:36	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 12:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 12:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 12:36	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 12:36	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 12:36	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 12:36	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		04/09/16 12:36	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		04/09/16 12:36	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/09/16 12:36	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**94.0**	mg/L	25.0	1		04/07/16 17:19		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: BG-1 **Lab ID: 92292667003** Collected: 04/05/16 11:20 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**264**	mg/L	5.0	5		04/13/16 04:45	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		04/12/16 14:26	16984-48-8	
Sulfate	**19.6**	mg/L	1.0	1		04/12/16 14:26	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:09	7440-38-2	
Barium	**302**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:09	7440-43-9	
Calcium	**27300**	ug/L	100	1	04/08/16 15:10	04/12/16 02:09	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:09	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:09	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:09	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:09	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.0**	ug/L	5.0	1	04/08/16 11:47	04/11/16 15:47	7440-42-8	
Lithium	**36.8**	ug/L	2.5	5	04/08/16 11:47	04/12/16 11:15	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:38	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 13:44	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 13:44	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 13:44	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 13:44	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 13:44	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 13:44	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 13:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 13:44	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 13:44	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 13:44	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 13:44	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 13:44	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 13:44	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 13:44	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 13:44	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: BG-1 **Lab ID: 92292667003** Collected: 04/05/16 11:20 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 13:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 13:44	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 13:44	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 13:44	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 13:44	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 13:44	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 13:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 13:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 13:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 13:44	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 13:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 13:44	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 13:44	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 13:44	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 13:44	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 13:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 13:44	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 13:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 13:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 13:44	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 13:44	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 13:44	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 13:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 13:44	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 13:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 13:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 13:44	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 13:44	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 13:44	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 13:44	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		04/09/16 13:44	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/09/16 13:44	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/09/16 13:44	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**628**	mg/L	25.0	1		04/07/16 17:19		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: MW-5 **Lab ID: 92292667004** Collected: 04/05/16 12:20 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**18.0**	mg/L	1.0	1		04/12/16 14:48	16887-00-6	
Fluoride	**0.52**	mg/L	0.10	1		04/12/16 14:48	16984-48-8	
Sulfate	**3.1**	mg/L	1.0	1		04/12/16 14:48	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:13	7440-38-2	
Barium	**91.4**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:13	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:13	7440-43-9	
Calcium	**10100**	ug/L	100	1	04/08/16 15:10	04/12/16 02:13	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:13	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:13	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:13	7440-62-2	
Zinc	**36.1**	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:13	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**12.1**	ug/L	5.0	1	04/08/16 11:47	04/11/16 15:50	7440-42-8	
Lithium	**9.7**	ug/L	2.5	5	04/08/16 11:47	04/12/16 11:21	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:41	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 08:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 08:52	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 08:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 08:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 08:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 08:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 08:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 08:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 08:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 08:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 08:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 08:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 08:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 08:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 08:52	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: MW-5 **Lab ID: 92292667004** Collected: 04/05/16 12:20 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 08:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 08:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 08:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 08:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 08:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 08:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 08:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 08:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 08:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 08:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 08:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 08:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 08:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 08:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 08:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 08:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 08:52	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 08:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 08:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 08:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 08:52	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 08:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 08:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 08:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 08:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 08:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 08:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 08:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 08:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 08:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		04/09/16 08:52	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		04/09/16 08:52	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 08:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**194**	mg/L	25.0	1		04/07/16 17:20		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: LEACHATE-1 **Lab ID: 92292667005** Collected: 04/05/16 14:10 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**239**	mg/L	5.0	5		04/13/16 05:14	16887-00-6	
Fluoride	**0.34**	mg/L	0.10	1		04/12/16 15:10	16984-48-8	
Sulfate	**94.5**	mg/L	1.0	1		04/12/16 15:10	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**10.7**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-36-0	
Arsenic	**11.6**	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:16	7440-38-2	
Barium	**177**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:16	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:16	7440-43-9	
Calcium	**102000**	ug/L	500	5	04/08/16 15:10	04/12/16 16:31	7440-70-2	
Chromium	**8.6**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7439-92-1	
Molybdenum	**133**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-02-0	
Selenium	**246**	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:16	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:16	7440-28-0	
Vanadium	**27.6**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:16	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:16	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**690**	ug/L	25.0	5	04/08/16 11:47	04/12/16 11:30	7440-42-8	
Lithium	**40.0**	ug/L	2.5	5	04/08/16 11:47	04/12/16 11:30	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:43	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 09:09	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 09:09	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 09:09	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 09:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 09:09	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 09:09	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 09:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 09:09	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 09:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 09:09	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 09:09	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 09:09	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 09:09	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 09:09	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 09:09	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: LEACHATE-1 **Lab ID: 92292667005** Collected: 04/05/16 14:10 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 09:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 09:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 09:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 09:09	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 09:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 09:09	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 09:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 09:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 09:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 09:09	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 09:09	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 09:09	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 09:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 09:09	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 09:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 09:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 09:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 09:09	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 09:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 09:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 09:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 09:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 09:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 09:09	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 09:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 09:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 09:09	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		04/09/16 09:09	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/09/16 09:09	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/09/16 09:09	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**516**	mg/L	25.0	1		04/07/16 17:20		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: MW-6 **Lab ID: 92292667006** Collected: 04/05/16 16:15 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**15.3**	mg/L	1.0	1		04/12/16 15:32	16887-00-6	
Fluoride	**0.18**	mg/L	0.10	1		04/12/16 15:32	16984-48-8	
Sulfate	**214**	mg/L	4.0	4		04/13/16 05:42	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:19	7440-38-2	
Barium	**108**	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:19	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:19	7440-43-9	
Calcium	**33600**	ug/L	100	1	04/08/16 15:10	04/12/16 02:19	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:19	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:19	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:19	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:19	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10.8**	ug/L	5.0	1	04/08/16 11:47	04/11/16 16:01	7440-42-8	
Lithium	**41.2**	ug/L	2.5	5	04/08/16 11:47	04/12/16 11:33	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:45	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 09:26	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 09:26	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 09:26	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 09:26	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 09:26	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 09:26	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 09:26	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 09:26	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 09:26	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 09:26	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 09:26	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 09:26	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 09:26	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 09:26	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 09:26	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: MW-6 **Lab ID: 92292667006** Collected: 04/05/16 16:15 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 09:26	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 09:26	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 09:26	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 09:26	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 09:26	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 09:26	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:26	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:26	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:26	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 09:26	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 09:26	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 09:26	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 09:26	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 09:26	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 09:26	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 09:26	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 09:26	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 09:26	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 09:26	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 09:26	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 09:26	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 09:26	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 09:26	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 09:26	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 09:26	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 09:26	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 09:26	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 09:26	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 09:26	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 09:26	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		04/09/16 09:26	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/09/16 09:26	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		04/09/16 09:26	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**689**	mg/L	25.0	1		04/07/16 17:20		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: AMBIENT BLANK **Lab ID: 92292667007** Collected: 04/05/16 11:30 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		04/12/16 15:54	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 15:54	16984-48-8	
Sulfate	ND	mg/L	1.0	1		04/12/16 15:54	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:22	7440-38-2	
Barium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:22	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:22	7440-43-9	
Calcium	ND	ug/L	100	1	04/08/16 15:10	04/12/16 02:22	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:22	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:22	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:22	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:22	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	04/08/16 11:47	04/11/16 16:04	7440-42-8	
Lithium	ND	ug/L	0.50	1	04/08/16 11:47	04/12/16 11:36	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:48	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 09:44	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 09:44	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 09:44	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 09:44	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 09:44	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 09:44	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 09:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 09:44	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 09:44	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 09:44	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 09:44	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 09:44	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 09:44	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 09:44	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 09:44	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: AMBIENT BLANK **Lab ID: 92292667007** Collected: 04/05/16 11:30 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 09:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 09:44	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 09:44	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 09:44	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 09:44	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 09:44	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 09:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 09:44	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 09:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 09:44	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 09:44	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 09:44	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 09:44	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 09:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 09:44	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 09:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 09:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 09:44	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 09:44	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 09:44	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 09:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 09:44	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 09:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 09:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 09:44	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 09:44	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 09:44	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 09:44	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		04/09/16 09:44	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		04/09/16 09:44	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		04/09/16 09:44	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		04/07/16 17:21		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: EQ. BLANK **Lab ID: 92292667008** Collected: 04/05/16 18:00 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		04/12/16 16:16	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 16:16	16984-48-8	
Sulfate	ND	mg/L	1.0	1		04/12/16 16:16	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:25	7440-38-2	
Barium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:25	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/08/16 15:10	04/12/16 02:25	7440-43-9	
Calcium	ND	ug/L	100	1	04/08/16 15:10	04/12/16 02:25	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-48-4	
Copper	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-50-8	
Lead	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:25	7782-49-2	
Silver	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/08/16 15:10	04/12/16 02:25	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/08/16 15:10	04/12/16 02:25	7440-62-2	
Zinc	**10.5**	ug/L	10.0	1	04/08/16 15:10	04/12/16 02:25	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	04/08/16 11:47	04/11/16 16:07	7440-42-8	
Lithium	ND	ug/L	0.50	1	04/08/16 11:47	04/12/16 11:39	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/08/16 17:50	04/09/16 19:50	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 10:01	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 10:01	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 10:01	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 10:01	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 10:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 10:01	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 10:01	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 10:01	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 10:01	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 10:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 10:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 10:01	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 10:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 10:01	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 10:01	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: EQ. BLANK **Lab ID: 92292667008** Collected: 04/05/16 18:00 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 10:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:01	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:01	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 10:01	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:01	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 10:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:01	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 10:01	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 10:01	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 10:01	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 10:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 10:01	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 10:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 10:01	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 10:01	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 10:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 10:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 10:01	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 10:01	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 10:01	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 10:01	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		04/09/16 10:01	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/09/16 10:01	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 10:01	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		04/07/16 17:21		

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: TRIP BLANK **Lab ID: 92292667009** Collected: 04/05/16 07:00 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 04:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 04:35	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 04:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 04:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 04:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 04:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 04:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 04:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 04:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 04:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 04:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 04:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 04:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 04:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 04:35	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		04/09/16 04:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 04:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 04:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 04:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 04:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 04:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 04:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 04:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 04:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 04:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 04:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 04:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 04:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 04:35	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 04:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 04:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 04:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 04:35	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 04:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 04:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 04:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 04:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 04:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 04:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 04:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 04:35	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 04:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		04/09/16 04:35	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: TRIP BLANK **Lab ID: 92292667009** Collected: 04/05/16 07:00 Received: 04/06/16 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/09/16 04:35	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 04:35	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: GWD/3044 — Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 — Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 1707225 — Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/12/16 12:14	
Fluoride	mg/L	ND	0.10	04/12/16 12:14	
Sulfate	mg/L	ND	1.0	04/12/16 12:14	

LABORATORY CONTROL SAMPLE: 1707226

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.7	103	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	50	50.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707227 1707228

Parameter	Units	92292667001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.7	50	50	64.2	64.7	101	102	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	98	99	90-110	1	20	
Sulfate	mg/L	5.5	50	50	55.7	56.3	100	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707229 1707230

Parameter	Units	92292932003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	342	50	50	384	386	84	89	90-110	1	20	M6
Fluoride	mg/L	0.13	2.5	2.5	2.5	2.6	97	99	90-110	2	20	
Sulfate	mg/L	10.5	50	50	60.3	61.3	100	102	90-110	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: MERP/9220 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 1703999 | Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	04/09/16 19:10	

LABORATORY CONTROL SAMPLE: 1704000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1704001 1704002

Parameter	Units	92290162023 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.4	96	95	75-125	1	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: MPRP/21287 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 1704440 | Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	04/12/16 01:36	
Arsenic	ug/L	ND	10.0	04/12/16 01:36	
Barium	ug/L	ND	5.0	04/12/16 01:36	
Beryllium	ug/L	ND	1.0	04/12/16 01:36	
Cadmium	ug/L	ND	1.0	04/12/16 01:36	
Calcium	ug/L	ND	100	04/12/16 01:36	
Chromium	ug/L	ND	5.0	04/12/16 01:36	
Cobalt	ug/L	ND	5.0	04/12/16 01:36	
Copper	ug/L	ND	5.0	04/12/16 01:36	
Lead	ug/L	ND	5.0	04/12/16 01:36	
Molybdenum	ug/L	ND	5.0	04/12/16 01:36	
Nickel	ug/L	ND	5.0	04/12/16 01:36	
Selenium	ug/L	ND	10.0	04/12/16 01:36	
Silver	ug/L	ND	5.0	04/12/16 01:36	
Thallium	ug/L	ND	5.4	04/12/16 01:36	
Vanadium	ug/L	ND	5.0	04/12/16 01:36	
Zinc	ug/L	ND	10.0	04/12/16 01:36	

LABORATORY CONTROL SAMPLE: 1704441

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	473	95	80-120	
Arsenic	ug/L	500	445	89	80-120	
Barium	ug/L	500	496	99	80-120	
Beryllium	ug/L	500	486	97	80-120	
Cadmium	ug/L	500	475	95	80-120	
Calcium	ug/L	5000	4990	100	80-120	
Chromium	ug/L	500	474	95	80-120	
Cobalt	ug/L	500	464	93	80-120	
Copper	ug/L	500	480	96	80-120	
Lead	ug/L	500	465	93	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Nickel	ug/L	500	472	94	80-120	
Selenium	ug/L	500	469	94	80-120	
Silver	ug/L	250	242	97	80-120	
Thallium	ug/L	500	467	93	80-120	
Vanadium	ug/L	500	462	92	80-120	
Zinc	ug/L	500	458	92	80-120	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1704442 1704443

Parameter	Units	92292081006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	470	457	94	91	75-125	3	25	
Arsenic	ug/L	3.0J	500	500	445	435	88	86	75-125	2	25	
Barium	ug/L	19.6	500	500	509	495	98	95	75-125	3	25	
Beryllium	ug/L	ND	500	500	484	473	97	95	75-125	2	25	
Cadmium	ug/L	ND	500	500	472	458	94	92	75-125	3	25	
Calcium	ug/L	7240	5000	5000	12200	12100	100	98	75-125	1	25	
Chromium	ug/L	ND	500	500	473	460	94	92	75-125	3	25	
Cobalt	ug/L	ND	500	500	461	446	92	89	75-125	3	25	
Copper	ug/L	ND	500	500	481	464	96	93	75-125	4	25	
Lead	ug/L	ND	500	500	457	445	91	89	75-125	3	25	
Molybdenum	ug/L	ND	500	500	498	484	100	97	75-125	3	25	
Nickel	ug/L	ND	500	500	470	456	94	91	75-125	3	25	
Selenium	ug/L	ND	500	500	464	451	93	90	75-125	3	25	
Silver	ug/L	ND	250	250	241	235	97	94	75-125	3	25	
Thallium	ug/L	ND	500	500	463	454	92	91	75-125	2	25	
Vanadium	ug/L	ND	500	500	463	450	92	90	75-125	3	25	
Zinc	ug/L	5.7J	500	500	458	444	91	88	75-125	3	25	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: MPRP/62482 — Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 — Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 2226863 — Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	04/11/16 15:24	
Lithium	ug/L	ND	0.50	04/12/16 10:53	

LABORATORY CONTROL SAMPLE: 2226864

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	82.6	103	80-120	
Lithium	ug/L	80	83.7	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2226865 2226866

Parameter	Units	92292667001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	34.4	80	80	118	113	104	98	75-125	4	20	
Lithium	ug/L	1.1	80	80	84.1	82.6	104	102	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: MSV/36304 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92292667004, 92292667005, 92292667006, 92292667007, 92292667008, 92292667009

METHOD BLANK: 1705596 Matrix: Water
Associated Lab Samples: 92292667004, 92292667005, 92292667006, 92292667007, 92292667008, 92292667009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1-Dichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1-Dichloroethene	ug/L	ND	1.0	04/09/16 03:43	
1,2,3-Trichloropropane	ug/L	ND	1.0	04/09/16 03:43	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/09/16 03:43	
1,2-Dichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,2-Dichloropropane	ug/L	ND	1.0	04/09/16 03:43	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/09/16 03:43	
2-Butanone (MEK)	ug/L	ND	5.0	04/09/16 03:43	
2-Hexanone	ug/L	ND	5.0	04/09/16 03:43	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/09/16 03:43	
Acetone	ug/L	ND	25.0	04/09/16 03:43	
Acrylonitrile	ug/L	ND	10.0	04/09/16 03:43	
Benzene	ug/L	ND	1.0	04/09/16 03:43	
Bromochloromethane	ug/L	ND	1.0	04/09/16 03:43	
Bromodichloromethane	ug/L	ND	1.0	04/09/16 03:43	
Bromoform	ug/L	ND	1.0	04/09/16 03:43	
Bromomethane	ug/L	ND	2.0	04/09/16 03:43	
Carbon disulfide	ug/L	ND	2.0	04/09/16 03:43	
Carbon tetrachloride	ug/L	ND	1.0	04/09/16 03:43	
Chlorobenzene	ug/L	ND	1.0	04/09/16 03:43	
Chloroethane	ug/L	ND	1.0	04/09/16 03:43	
Chloroform	ug/L	ND	1.0	04/09/16 03:43	
Chloromethane	ug/L	ND	1.0	04/09/16 03:43	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 03:43	
cis-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 03:43	
Dibromochloromethane	ug/L	ND	1.0	04/09/16 03:43	
Dibromomethane	ug/L	ND	1.0	04/09/16 03:43	
Ethylbenzene	ug/L	ND	1.0	04/09/16 03:43	
Iodomethane	ug/L	ND	5.0	04/09/16 03:43	
Methylene Chloride	ug/L	ND	1.0	04/09/16 03:43	
Styrene	ug/L	ND	1.0	04/09/16 03:43	
Tetrachloroethene	ug/L	ND	1.0	04/09/16 03:43	
Toluene	ug/L	ND	1.0	04/09/16 03:43	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 03:43	
trans-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 03:43	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	04/09/16 03:43	
Trichloroethene	ug/L	ND	1.0	04/09/16 03:43	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

METHOD BLANK: 1705596 Matrix: Water
Associated Lab Samples: 92292667004, 92292667005, 92292667006, 92292667007, 92292667008, 92292667009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	04/09/16 03:43	
Vinyl acetate	ug/L	ND	2.0	04/09/16 03:43	
Vinyl chloride	ug/L	ND	1.0	04/09/16 03:43	
Xylene (Total)	ug/L	ND	2.0	04/09/16 03:43	
1,2-Dichloroethane-d4 (S)	%	102	70-130	04/09/16 03:43	
4-Bromofluorobenzene (S)	%	99	70-130	04/09/16 03:43	
Toluene-d8 (S)	%	100	70-130	04/09/16 03:43	

LABORATORY CONTROL SAMPLE: 1705597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.6	99	80-125	
1,1,1-Trichloroethane	ug/L	50	47.8	96	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	50.1	100	79-124	
1,1,2-Trichloroethane	ug/L	50	46.8	94	85-125	
1,1-Dichloroethane	ug/L	50	47.0	94	73-126	
1,1-Dichloroethene	ug/L	50	49.1	98	66-135	
1,2,3-Trichloropropane	ug/L	50	49.4	99	75-130	
1,2-Dichlorobenzene	ug/L	50	47.5	95	80-133	
1,2-Dichloroethane	ug/L	50	44.2	88	67-128	
1,2-Dichloropropane	ug/L	50	46.6	93	75-132	
1,4-Dichlorobenzene	ug/L	50	48.1	96	78-130	
2-Butanone (MEK)	ug/L	100	99.8	100	61-144	
2-Hexanone	ug/L	100	107	107	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	104	104	72-135	
Acetone	ug/L	100	102	102	48-146	
Acrylonitrile	ug/L	250	284	114	40-160	
Benzene	ug/L	50	47.5	95	80-125	
Bromochloromethane	ug/L	50	45.3	91	71-125	
Bromodichloromethane	ug/L	50	47.0	94	78-124	
Bromoform	ug/L	50	49.5	99	71-128	
Bromomethane	ug/L	50	34.2	68	40-160	
Carbon disulfide	ug/L	50	48.3	97	50-160	
Carbon tetrachloride	ug/L	50	47.9	96	69-131	
Chlorobenzene	ug/L	50	48.2	96	81-122	
Chloroethane	ug/L	50	43.8	88	39-148	
Chloroform	ug/L	50	46.3	93	73-127	
Chloromethane	ug/L	50	44.8	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	46.4	93	74-124	
cis-1,3-Dichloropropene	ug/L	50	47.7	95	72-132	
Dibromochloromethane	ug/L	50	50.3	101	78-125	
Dibromomethane	ug/L	50	45.7	91	82-120	
Ethylbenzene	ug/L	50	47.9	96	79-121	
Iodomethane	ug/L	100	84.9	85	39-154	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

LABORATORY CONTROL SAMPLE: 1705597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	48.8	98	64-133	
Styrene	ug/L	50	48.9	98	84-126	
Tetrachloroethene	ug/L	50	47.1	94	78-122	
Toluene	ug/L	50	46.9	94	80-121	
trans-1,2-Dichloroethene	ug/L	50	48.1	96	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.3	97	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	49.3	99	40-160	
Trichloroethene	ug/L	50	46.5	93	78-122	
Trichlorofluoromethane	ug/L	50	45.0	90	53-137	
Vinyl acetate	ug/L	100	92.6	93	40-160	
Vinyl chloride	ug/L	50	49.2	98	58-137	
Xylene (Total)	ug/L	150	142	95	81-126	
1,2-Dichloroethane-d4 (S)	%			98	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1705598

Parameter	Units	92292398002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	22.0	110	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.8	114	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.7	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.3	102	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,1-Dichloroethene	ug/L	ND	20	24.1	120	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.6	108	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.2	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	19.5	97	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.9	104	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.3	107	70-130	
2-Butanone (MEK)	ug/L	ND	40	43.8	109	70-130	
2-Hexanone	ug/L	ND	40	44.5	111	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.3	106	70-130	
Acetone	ug/L	ND	40	44.4	111	70-130	
Acrylonitrile	ug/L	ND	100	124	124	70-130	
Benzene	ug/L	ND	20	22.4	112	70-148	
Bromochloromethane	ug/L	ND	20	20.7	103	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	104	70-130	
Bromoform	ug/L	ND	20	19.6	98	70-130	
Bromomethane	ug/L	ND	20	22.0	110	70-130	
Carbon disulfide	ug/L	ND	20	23.5	118	70-130	
Carbon tetrachloride	ug/L	ND	20	22.6	113	70-130	
Chlorobenzene	ug/L	ND	20	22.3	111	70-146	
Chloroethane	ug/L	ND	20	21.7	109	70-130	
Chloroform	ug/L	ND	20	20.7	104	70-130	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

MATRIX SPIKE SAMPLE: 1705598

Parameter	Units	92292398002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	21.6	108	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.8	109	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.7	104	70-130	
Dibromochloromethane	ug/L	ND	20	20.5	102	70-130	
Dibromomethane	ug/L	ND	20	20.4	102	70-130	
Ethylbenzene	ug/L	ND	20	22.3	111	70-130	
Iodomethane	ug/L	ND	40	44.9	112	70-130	
Methylene Chloride	ug/L	ND	20	21.2	106	70-130	
Styrene	ug/L	ND	20	21.8	109	70-130	
Tetrachloroethene	ug/L	ND	20	21.7	109	70-130	
Toluene	ug/L	ND	20	22.0	110	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.1	111	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	20.8	104	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	19.0	95	70-130	
Trichloroethene	ug/L	ND	20	22.0	110	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.6	113	70-130	
Vinyl acetate	ug/L	ND	40	32.5	81	70-130	
Vinyl chloride	ug/L	ND	20	24.2	121	70-130	
1,2-Dichloroethane-d4 (S)	%				100	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1705599

Parameter	Units	92292398003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

SAMPLE DUPLICATE: 1705599

Parameter	Units	92292398003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	100	3		
4-Bromofluorobenzene (S)	%	98	100	2		
Toluene-d8 (S)	%	101	99	2		

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: MSV/36305 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92292667001, 92292667002, 92292667003

METHOD BLANK: 1705600 Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1-Dichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1-Dichloroethene	ug/L	ND	1.0	04/09/16 04:00	
1,2,3-Trichloropropane	ug/L	ND	1.0	04/09/16 04:00	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/09/16 04:00	
1,2-Dichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,2-Dichloropropane	ug/L	ND	1.0	04/09/16 04:00	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/09/16 04:00	
2-Butanone (MEK)	ug/L	ND	5.0	04/09/16 04:00	
2-Hexanone	ug/L	ND	5.0	04/09/16 04:00	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/09/16 04:00	
Acetone	ug/L	ND	25.0	04/09/16 04:00	
Acrylonitrile	ug/L	ND	10.0	04/09/16 04:00	
Benzene	ug/L	ND	1.0	04/09/16 04:00	
Bromochloromethane	ug/L	ND	1.0	04/09/16 04:00	
Bromodichloromethane	ug/L	ND	1.0	04/09/16 04:00	
Bromoform	ug/L	ND	1.0	04/09/16 04:00	
Bromomethane	ug/L	ND	2.0	04/09/16 04:00	
Carbon disulfide	ug/L	ND	2.0	04/09/16 04:00	
Carbon tetrachloride	ug/L	ND	1.0	04/09/16 04:00	
Chlorobenzene	ug/L	ND	1.0	04/09/16 04:00	
Chloroethane	ug/L	ND	1.0	04/09/16 04:00	
Chloroform	ug/L	ND	1.0	04/09/16 04:00	
Chloromethane	ug/L	ND	1.0	04/09/16 04:00	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 04:00	
cis-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 04:00	
Dibromochloromethane	ug/L	ND	1.0	04/09/16 04:00	
Dibromomethane	ug/L	ND	1.0	04/09/16 04:00	
Ethylbenzene	ug/L	ND	1.0	04/09/16 04:00	
Iodomethane	ug/L	ND	5.0	04/09/16 04:00	
Methylene Chloride	ug/L	ND	1.0	04/09/16 04:00	
Styrene	ug/L	ND	1.0	04/09/16 04:00	
Tetrachloroethene	ug/L	ND	1.0	04/09/16 04:00	
Toluene	ug/L	ND	1.0	04/09/16 04:00	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 04:00	
trans-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 04:00	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	04/09/16 04:00	
Trichloroethene	ug/L	ND	1.0	04/09/16 04:00	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

METHOD BLANK: 1705600 Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	04/09/16 04:00	
Vinyl acetate	ug/L	ND	2.0	04/09/16 04:00	
Vinyl chloride	ug/L	ND	1.0	04/09/16 04:00	
Xylene (Total)	ug/L	ND	2.0	04/09/16 04:00	
1,2-Dichloroethane-d4 (S)	%	102	70-130	04/09/16 04:00	
4-Bromofluorobenzene (S)	%	99	70-130	04/09/16 04:00	
Toluene-d8 (S)	%	102	70-130	04/09/16 04:00	

LABORATORY CONTROL SAMPLE: 1705601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.9	102	80-125	
1,1,1-Trichloroethane	ug/L	50	50.4	101	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	50.4	101	79-124	
1,1,2-Trichloroethane	ug/L	50	47.3	95	85-125	
1,1-Dichloroethane	ug/L	50	48.1	96	73-126	
1,1-Dichloroethene	ug/L	50	51.6	103	66-135	
1,2,3-Trichloropropane	ug/L	50	50.5	101	75-130	
1,2-Dichlorobenzene	ug/L	50	48.1	96	80-133	
1,2-Dichloroethane	ug/L	50	44.2	88	67-128	
1,2-Dichloropropane	ug/L	50	47.7	95	75-132	
1,4-Dichlorobenzene	ug/L	50	48.9	98	78-130	
2-Butanone (MEK)	ug/L	100	98.6	99	61-144	
2-Hexanone	ug/L	100	105	105	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	103	72-135	
Acetone	ug/L	100	97.1	97	48-146	
Acrylonitrile	ug/L	250	281	112	40-160	
Benzene	ug/L	50	49.5	99	80-125	
Bromochloromethane	ug/L	50	45.5	91	71-125	
Bromodichloromethane	ug/L	50	48.1	96	78-124	
Bromoform	ug/L	50	48.6	97	71-128	
Bromomethane	ug/L	50	37.3	75	40-160	
Carbon disulfide	ug/L	50	51.0	102	50-160	
Carbon tetrachloride	ug/L	50	50.2	100	69-131	
Chlorobenzene	ug/L	50	49.6	99	81-122	
Chloroethane	ug/L	50	45.3	91	39-148	
Chloroform	ug/L	50	46.9	94	73-127	
Chloromethane	ug/L	50	45.2	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.6	95	74-124	
cis-1,3-Dichloropropene	ug/L	50	49.3	99	72-132	
Dibromochloromethane	ug/L	50	50.4	101	78-125	
Dibromomethane	ug/L	50	46.6	93	82-120	
Ethylbenzene	ug/L	50	49.7	99	79-121	
Iodomethane	ug/L	100	88.6	89	39-154	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

LABORATORY CONTROL SAMPLE: 1705601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.3	99	64-133	
Styrene	ug/L	50	50.3	101	84-126	
Tetrachloroethene	ug/L	50	48.9	98	78-122	
Toluene	ug/L	50	49.1	98	80-121	
trans-1,2-Dichloroethene	ug/L	50	50.4	101	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.8	98	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	45.9	92	40-160	
Trichloroethene	ug/L	50	48.6	97	78-122	
Trichlorofluoromethane	ug/L	50	48.8	98	53-137	
Vinyl acetate	ug/L	100	91.4	91	40-160	
Vinyl chloride	ug/L	50	51.8	104	58-137	
Xylene (Total)	ug/L	150	146	97	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1705602

Parameter	Units	92292290018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.3	102	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.8	109	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.4	97	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.4	97	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.1	105	70-130	
1,1-Dichloroethene	ug/L	ND	20	22.6	113	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	20.2	101	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.9	99	70-130	
1,2-Dichloroethane	ug/L	ND	20	18.6	92	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.0	100	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.0	100	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.8	102	70-130	
2-Hexanone	ug/L	ND	40	41.3	103	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.9	100	70-130	
Acetone	ug/L	ND	40	37.7	94	70-130	
Acrylonitrile	ug/L	ND	100	115	115	70-130	
Benzene	ug/L	ND	20	21.3	107	70-148	
Bromochloromethane	ug/L	ND	20	20.0	100	70-130	
Bromodichloromethane	ug/L	ND	20	19.9	99	70-130	
Bromoform	ug/L	ND	20	18.6	93	70-130	
Bromomethane	ug/L	ND	20	21.7	108	70-130	
Carbon disulfide	ug/L	ND	20	22.2	111	70-130	
Carbon tetrachloride	ug/L	ND	20	22.0	110	70-130	
Chlorobenzene	ug/L	ND	20	20.9	105	70-146	
Chloroethane	ug/L	ND	20	19.8	99	70-130	
Chloroform	ug/L	ND	20	20.3	101	70-130	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

MATRIX SPIKE SAMPLE: 1705602

Parameter	Units	92292290018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	20.4	102	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.3	102	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
Dibromochloromethane	ug/L	ND	20	19.7	98	70-130	
Dibromomethane	ug/L	ND	20	19.4	97	70-130	
Ethylbenzene	ug/L	ND	20	21.2	106	70-130	
Iodomethane	ug/L	ND	40	43.9	110	70-130	
Methylene Chloride	ug/L	ND	20	20.3	101	70-130	
Styrene	ug/L	ND	20	20.2	101	70-130	
Tetrachloroethene	ug/L	ND	20	20.3	102	70-130	
Toluene	ug/L	ND	20	21.1	106	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.6	108	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	18.3	92	70-130	
Trichloroethene	ug/L	ND	20	20.8	104	69-151	
Trichlorofluoromethane	ug/L	ND	20	21.3	107	70-130	
Vinyl acetate	ug/L	ND	40	30.2	76	70-130	
Vinyl chloride	ug/L	ND	20	22.8	114	70-130	
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1705603

Parameter	Units	92292290019 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

SAMPLE DUPLICATE: 1705603

Parameter	Units	92292290019 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	105	102	3		
4-Bromofluorobenzene (S)	%	100	98	2		
Toluene-d8 (S)	%	103	101	2		

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QUALITY CONTROL DATA

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: WET/44096 — Analysis Method: SM 2540C
QC Batch Method: SM 2540C — Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 1704626 — Matrix: Water
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	04/07/16 17:12	

LABORATORY CONTROL SAMPLE: 1704627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 1704628

Parameter	Units	92292607010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 1704629

Parameter	Units	92292612011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	169	156	8	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: SW-2 **Lab ID: 92292667001** Collected: 04/05/16 09:40 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.133 ± 0.304 (0.716)** **C:NA T:92%**	pCi/L	05/02/16 10:28	13982-63-3	
Radium-228	EPA 904.0	**0.397 ± 0.409 (0.849)** **C:82% T:73%**	pCi/L	04/29/16 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: SW-1 **Lab ID: 92292667002** Collected: 04/05/16 10:20 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.499 ± 0.507 (0.767)** **C:NA T:91%**	pCi/L	05/02/16 10:29	13982-63-3	
Radium-228	EPA 904.0	**0.761 ± 0.424 (0.772)** **C:82% T:81%**	pCi/L	04/29/16 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: BG-1 **Lab ID: 92292667003** Collected: 04/05/16 11:20 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.407 ± 0.423 (0.630)** **C:NA T:92%**	pCi/L	05/02/16 10:28	13982-63-3	
Radium-228	EPA 904.0	**0.828 ± 0.409 (0.714)** **C:82% T:87%**	pCi/L	04/29/16 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: MW-5 **Lab ID: 92292667004** Collected: 04/05/16 12:20 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.310 (0.632)** **C:NA T:93%**	pCi/L	05/02/16 10:32	13982-63-3	
Radium-228	EPA 904.0	**0.951 ± 0.430 (0.731)** **C:83% T:90%**	pCi/L	04/29/16 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: LEACHATE-1 **Lab ID: 92292667005** Collected: 04/05/16 14:10 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.283 ± 0.440 (0.761)** **C:NA T:91%**	pCi/L	05/02/16 10:41	13982-63-3	
Radium-228	EPA 904.0	**0.742 ± 0.408 (0.740)** **C:82% T:85%**	pCi/L	04/29/16 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: MW-6 **Lab ID: 92292667006** Collected: 04/05/16 16:15 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.068 ± 0.310 (0.730) C:NA T:93%**	pCi/L	05/02/16 10:41	13982-63-3	
Radium-228	EPA 904.0	**0.912 ± 0.437 (0.747) C:81% T:79%**	pCi/L	04/29/16 14:45	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: AMBIENT BLANK **Lab ID: 92292667007** Collected: 04/05/16 11:30 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.192 ± 0.294 (0.472)** **C:NA T:97%**	pCi/L	05/02/16 10:42	13982-63-3	
Radium-228	EPA 904.0	**0.603 ± 0.369 (0.693)** **C:82% T:89%**	pCi/L	04/29/16 14:46	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Sample: EQ. BLANK **Lab ID: 92292667008** Collected: 04/05/16 18:00 Received: 04/06/16 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.212 ± 0.323 (0.191)** **C:NA T:90%**	pCi/L	05/02/16 10:52	13982-63-3	
Radium-228	EPA 904.0	**0.512 ± 0.370 (0.725)** **C:83% T:86%**	pCi/L	04/29/16 14:46	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: RADC/29085 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 1063308 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.248 ± 0.339 (0.726) C:79% T:84%	pCi/L	04/29/16 11:33	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

QC Batch: RADC/29080 | Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 | Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92292667001, 92292667002, 92292667003, 92292667004, 92292667005, 92292667006, 92292667007, 92292667008

METHOD BLANK: 1063303 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.135 ± 0.309 (0.497) C:NA T:91%	pCi/L	05/02/16 10:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92292667001	**SW-2**	EPA 300.0	GWD/3044		
92292667002	**SW-1**	EPA 300.0	GWD/3044		
92292667003	**BG-1**	EPA 300.0	GWD/3044		
92292667004	**MW-5**	EPA 300.0	GWD/3044		
92292667005	**LEACHATE-1**	EPA 300.0	GWD/3044		
92292667006	**MW-6**	EPA 300.0	GWD/3044		
92292667007	**AMBIENT BLANK**	EPA 300.0	GWD/3044		
92292667008	**EQ. BLANK**	EPA 300.0	GWD/3044		
92292667001	**SW-2**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667002	**SW-1**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667003	**BG-1**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667004	**MW-5**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667005	**LEACHATE-1**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667006	**MW-6**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667007	**AMBIENT BLANK**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667008	**EQ. BLANK**	EPA 3010A	MPRP/21287	EPA 6010	ICP/19151
92292667001	**SW-2**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667002	**SW-1**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667003	**BG-1**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667004	**MW-5**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667005	**LEACHATE-1**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667006	**MW-6**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667007	**AMBIENT BLANK**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667008	**EQ. BLANK**	EPA 3020	MPRP/62482	EPA 6020B	ICPM/28879
92292667001	**SW-2**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667002	**SW-1**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667003	**BG-1**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667004	**MW-5**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667005	**LEACHATE-1**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667006	**MW-6**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667007	**AMBIENT BLANK**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667008	**EQ. BLANK**	EPA 7470	MERP/9220	EPA 7470	MERC/8863
92292667001	**SW-2**	EPA 8260	MSV/36305		
92292667002	**SW-1**	EPA 8260	MSV/36305		
92292667003	**BG-1**	EPA 8260	MSV/36305		
92292667004	**MW-5**	EPA 8260	MSV/36304		
92292667005	**LEACHATE-1**	EPA 8260	MSV/36304		
92292667006	**MW-6**	EPA 8260	MSV/36304		
92292667007	**AMBIENT BLANK**	EPA 8260	MSV/36304		
92292667008	**EQ. BLANK**	EPA 8260	MSV/36304		
92292667009	**TRIP BLANK**	EPA 8260	MSV/36304		
92292667001	**SW-2**	EPA 903.1	RADC/29080		
92292667002	**SW-1**	EPA 903.1	RADC/29080		
92292667003	**BG-1**	EPA 903.1	RADC/29080		
92292667004	**MW-5**	EPA 903.1	RADC/29080		
92292667005	**LEACHATE-1**	EPA 903.1	RADC/29080		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH-BRICKHAVEN
Pace Project No.: 92292667

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92292667006	**MW-6**	EPA 903.1	RADC/29080		
92292667007	**AMBIENT BLANK**	EPA 903.1	RADC/29080		
92292667008	**EQ. BLANK**	EPA 903.1	RADC/29080		
92292667001	**SW-2**	EPA 904.0	RADC/29085		
92292667002	**SW-1**	EPA 904.0	RADC/29085		
92292667003	**BG-1**	EPA 904.0	RADC/29085		
92292667004	**MW-5**	EPA 904.0	RADC/29085		
92292667005	**LEACHATE-1**	EPA 904.0	RADC/29085		
92292667006	**MW-6**	EPA 904.0	RADC/29085		
92292667007	**AMBIENT BLANK**	EPA 904.0	RADC/29085		
92292667008	**EQ. BLANK**	EPA 904.0	RADC/29085		
92292667001	**SW-2**	SM 2540C	WET/44096		
92292667002	**SW-1**	SM 2540C	WET/44096		
92292667003	**BG-1**	SM 2540C	WET/44096		
92292667004	**MW-5**	SM 2540C	WET/44096		
92292667005	**LEACHATE-1**	SM 2540C	WET/44096		
92292667006	**MW-6**	SM 2540C	WET/44096		
92292667007	**AMBIENT BLANK**	SM 2540C	WET/44096		
92292667008	**EQ. BLANK**	SM 2540C	WET/44096		

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Page 2 of 2 for Internal Use ONLY

Sample Condition Upon Receipt

Client Name: Pace Raleigh Charran-Brickhaven

Project #: **WO# : 92292667**

92292667

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☑ Yes ☐ No

Date/Initials Person Examining Contents: 4-6-16 KW

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____

Thermometer: ☑ T1505 ☐ 0.7 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** _____ **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☑ N/A	
Samples checked for dechlorination	☑ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager SCURF Review: JG **Date:** 4/6/16

Project Manager SRF Review: JG **Date:** 4/7/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1996841

Section A Required Client Information:

Company: HDR
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name: Charah - Brickhaven
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): Radium 226/228	metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92292667
1	SW-2		G	04/05/16	0940				11									3	2	3	1	1	1		001
2	SW-1				1020				11									3	2	3	1	1	1		002
3	BG-1				1120				11									3	2	3	1	1	1		003
4	MW-5				1220				11									3	2	3	1	1	1		004
5	Leachate-1				1410				11									3	2	3	1	1	1		005
6	MW-6				1615				11									3	2	3	1	1	1		006
7	Trip Blank				0700				2											2					009
8	Ambient Blank				1130				11									3	2	3	1		1		007
9	EQ. Blank				1800				11									3	2	3	1	1	1		008
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	04/05/16	1805	[illegible]	4/5/16	1015				
	[illegible]	4-6-16	12:00	[illegible]	4/6/16	1200	0.7	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 04/05/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

May 02, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on April 07, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92292932001	**MW-7**	Water	04/06/16 09:55	04/07/16 14:27
92292932002	**MW-8**	Water	04/06/16 11:40	04/07/16 14:27
92292932003	**MW-1**	Water	04/06/16 13:25	04/07/16 14:27
92292932004	**MW-1-FD**	Water	04/06/16 13:45	04/07/16 14:27
92292932005	**MW-2**	Water	04/06/16 16:30	04/07/16 14:27
92292932006	**TRIP BLANK**	Water	04/06/16 07:00	04/07/16 14:27
92292932007	**AMBIENT BLANK**	Water	04/06/16 13:00	04/07/16 14:27
92292932008	**EQ. BLANK**	Water	04/06/16 17:00	04/07/16 14:27

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92292932001	**MW-7**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92292932002	**MW-8**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92292932003	**MW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92292932004	**MW-1-FD**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92292932005	**MW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292932006	**TRIP BLANK**	EPA 8260	CCL	48	PASI-C
92292932007	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92292932008	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	CCL	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92292932001	**MW-7**					
EPA 300.0	Chloride	411	mg/L	8.0	04/13/16 07:39	
EPA 300.0	Fluoride	0.26	mg/L	0.10	04/12/16 17:22	
EPA 300.0	Sulfate	38.0	mg/L	1.0	04/12/16 17:22	
EPA 6010	Antimony	5.5	ug/L	5.0	04/12/16 16:49	
EPA 6010	Barium	208	ug/L	5.0	04/12/16 16:49	
EPA 6010	Calcium	40600	ug/L	100	04/12/16 16:49	
EPA 6020B	Boron	32.1	ug/L	5.0	04/11/16 16:22	
EPA 6020B	Lithium	20.7	ug/L	2.5	04/12/16 11:47	
EPA 903.1	Radium-226	0.279 ± 0.337 (0.514) C:NA T:92%	pCi/L		04/27/16 19:48	
EPA 904.0	Radium-228	0.188 ± 0.457 (1.01) C:83% T:85%	pCi/L		04/27/16 17:15	
SM 2540C	Total Dissolved Solids	982	mg/L	50.0	04/08/16 15:59	
92292932002	**MW-8**					
EPA 300.0	Chloride	685	mg/L	8.0	04/13/16 09:32	
EPA 300.0	Sulfate	5.7	mg/L	1.0	04/12/16 17:44	
EPA 6010	Antimony	8.1	ug/L	5.0	04/12/16 16:53	
EPA 6010	Barium	1220	ug/L	5.0	04/12/16 16:53	
EPA 6010	Calcium	159000	ug/L	1000	04/13/16 14:13	
EPA 6010	Zinc	47.7	ug/L	10.0	04/12/16 16:53	
EPA 6020B	Boron	8.9	ug/L	5.0	04/11/16 16:36	
EPA 6020B	Lithium	37.6	ug/L	2.5	04/12/16 12:07	
EPA 903.1	Radium-226	0.730 ± 0.574 (0.797) C:NA T:100%	pCi/L		04/27/16 20:25	
EPA 904.0	Radium-228	0.937 ± 0.479 (0.860) C:82% T:84%	pCi/L		04/27/16 17:15	
SM 2540C	Total Dissolved Solids	1130	mg/L	250	04/08/16 15:59	
92292932003	**MW-1**					
EPA 300.0	Chloride	342	mg/L	7.0	04/13/16 08:08	M6
EPA 300.0	Fluoride	0.13	mg/L	0.10	04/12/16 18:06	
EPA 300.0	Sulfate	10.5	mg/L	1.0	04/12/16 18:06	
EPA 6010	Barium	129	ug/L	5.0	04/12/16 16:56	
EPA 6010	Calcium	79900	ug/L	100	04/12/16 16:56	
EPA 6010	Zinc	10.2	ug/L	10.0	04/12/16 16:56	
EPA 6020B	Boron	10.6	ug/L	5.0	04/11/16 16:39	
EPA 6020B	Lithium	28.4	ug/L	2.5	04/12/16 12:10	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92292932003	**MW-1**					
EPA 903.1	Radium-226	0.141 ± 0.321 (0.517) C:NA T:92%	pCi/L		04/27/16 20:12	
EPA 904.0	Radium-228	0.402 ± 0.442 (0.930) C:81% T:89%	pCi/L		04/27/16 17:15	
SM 2540C	Total Dissolved Solids	770	mg/L	50.0	04/08/16 15:59	
92292932004	**MW-1-FD**					
EPA 300.0	Chloride	356	mg/L	7.0	04/13/16 10:00	
EPA 300.0	Fluoride	0.13	mg/L	0.10	04/12/16 19:12	
EPA 300.0	Sulfate	10.4	mg/L	1.0	04/12/16 19:12	
EPA 6010	Barium	137	ug/L	5.0	04/12/16 17:08	
EPA 6010	Calcium	83400	ug/L	100	04/12/16 17:08	
EPA 6020B	Boron	9.3	ug/L	5.0	04/11/16 16:42	
EPA 6020B	Lithium	28.3	ug/L	2.5	04/12/16 12:13	
EPA 903.1	Radium-226	0.127 ± 0.289 (0.466) C:NA T:96%	pCi/L		04/27/16 19:48	
EPA 904.0	Radium-228	0.463 ± 0.471 (0.984) C:80% T:87%	pCi/L		04/27/16 17:15	
SM 2540C	Total Dissolved Solids	754	mg/L	50.0	04/08/16 16:00	
92292932005	**MW-2**					
EPA 300.0	Chloride	1230	mg/L	20.0	04/13/16 13:33	
EPA 300.0	Fluoride	0.22	mg/L	0.10	04/12/16 19:34	
EPA 300.0	Sulfate	230	mg/L	8.0	04/13/16 10:28	
EPA 6010	Antimony	10.6	ug/L	5.0	04/12/16 17:11	
EPA 6010	Barium	230	ug/L	5.0	04/12/16 17:11	
EPA 6010	Calcium	192000	ug/L	1000	04/13/16 14:16	
EPA 6010	Chromium	5.7	ug/L	5.0	04/12/16 17:11	
EPA 6010	Molybdenum	9.5	ug/L	5.0	04/12/16 17:11	
EPA 6010	Zinc	113	ug/L	10.0	04/12/16 17:11	
EPA 6020B	Boron	47.3	ug/L	5.0	04/11/16 16:50	
EPA 6020B	Lithium	117	ug/L	2.5	04/12/16 12:16	
EPA 903.1	Radium-226	1.94 ± 0.882 (0.896) C:NA T:92%	pCi/L		04/27/16 20:12	
EPA 904.0	Radium-228	1.08 ± 0.521 (0.924) C:85% T:82%	pCi/L		04/27/16 17:15	
SM 2540C	Total Dissolved Solids	2700	mg/L	250	04/11/16 18:33	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92292932007	**AMBIENT BLANK**					
EPA 903.1	Radium-226	-0.137 ± 0.380 (0.898) C:NA T:93%	pCi/L		04/27/16 20:00	
EPA 904.0	Radium-228	0.463 ± 0.413 (0.837) C:83% T:76%	pCi/L		04/27/16 16:47	
SM 2540C	Total Dissolved Solids	30.0	mg/L	25.0	04/11/16 18:33	
92292932008	**EQ. BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.462 (0.959) C:NA T:90%	pCi/L		04/27/16 20:36	
EPA 904.0	Radium-228	0.0460 ± 0.286 (0.654) C:85% T:90%	pCi/L		04/27/16 16:47	
SM 2540C	Total Dissolved Solids	38.0	mg/L	25.0	04/11/16 18:34	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-7 **Lab ID: 92292932001** Collected: 04/06/16 09:55 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**411**	mg/L	8.0	8		04/13/16 07:39	16887-00-6	
Fluoride	**0.26**	mg/L	0.10	1		04/12/16 17:22	16984-48-8	
Sulfate	**38.0**	mg/L	1.0	1		04/12/16 17:22	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**5.5**	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:49	7440-38-2	
Barium	**208**	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 16:49	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 16:49	7440-43-9	
Calcium	**40600**	ug/L	100	1	04/11/16 12:50	04/12/16 16:49	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:49	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 16:49	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:49	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:49	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**32.1**	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:22	7440-42-8	
Lithium	**20.7**	ug/L	2.5	5	04/11/16 10:25	04/12/16 11:47	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 17:20	04/13/16 17:25	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 10:18	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 10:18	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 10:18	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 10:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 10:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 10:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 10:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 10:18	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 10:18	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 10:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 10:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 10:18	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 10:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 10:18	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 10:18	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-7 **Lab ID: 92292932001** Collected: 04/06/16 09:55 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 10:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:18	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 10:18	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:18	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 10:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:18	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 10:18	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 10:18	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 10:18	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 10:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 10:18	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 10:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:18	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 10:18	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 10:18	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:18	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 10:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 10:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 10:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 10:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 10:18	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 10:18	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		04/09/16 10:18	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		04/09/16 10:18	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 10:18	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**982**	mg/L	50.0	1		04/08/16 15:59		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-8 **Lab ID: 92292932002** Collected: 04/06/16 11:40 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**685**	mg/L	8.0	8		04/13/16 09:32	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 17:44	16984-48-8	
Sulfate	**5.7**	mg/L	1.0	1		04/12/16 17:44	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**8.1**	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:53	7440-38-2	
Barium	**1220**	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 16:53	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 16:53	7440-43-9	
Calcium	**159000**	ug/L	1000	10	04/11/16 12:50	04/13/16 14:13	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:53	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 16:53	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:53	7440-62-2	
Zinc	**47.7**	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:53	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**8.9**	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:36	7440-42-8	
Lithium	**37.6**	ug/L	2.5	5	04/11/16 10:25	04/12/16 12:07	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 17:20	04/13/16 17:28	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 10:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 10:35	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 10:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 10:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 10:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 10:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 10:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 10:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 10:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 10:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 10:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 10:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 10:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 10:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 10:35	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-8 **Lab ID: 92292932002** Collected: 04/06/16 11:40 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 10:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 10:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:35	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 10:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 10:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 10:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 10:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 10:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 10:35	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 10:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 10:35	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 10:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 10:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 10:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 10:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 10:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 10:35	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 10:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		04/09/16 10:35	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		04/09/16 10:35	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/09/16 10:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1130**	mg/L	250	1		04/08/16 15:59		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-1 **Lab ID: 92292932003** Collected: 04/06/16 13:25 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**342**	mg/L	7.0	7		04/13/16 08:08	16887-00-6	M6
Fluoride	**0.13**	mg/L	0.10	1		04/12/16 18:06	16984-48-8	
Sulfate	**10.5**	mg/L	1.0	1		04/12/16 18:06	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:56	7440-38-2	
Barium	**129**	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 16:56	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 16:56	7440-43-9	
Calcium	**79900**	ug/L	100	1	04/11/16 12:50	04/12/16 16:56	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:56	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 16:56	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 16:56	7440-62-2	
Zinc	**10.2**	ug/L	10.0	1	04/11/16 12:50	04/12/16 16:56	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10.6**	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:39	7440-42-8	
Lithium	**28.4**	ug/L	2.5	5	04/11/16 10:25	04/12/16 12:10	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 17:20	04/13/16 17:35	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 10:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 10:52	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 10:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 10:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 10:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 10:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 10:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 10:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 10:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 10:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 10:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 10:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 10:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 10:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 10:52	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-1 **Lab ID: 92292932003** Collected: 04/06/16 13:25 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 10:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 10:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 10:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 10:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 10:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 10:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 10:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 10:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 10:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 10:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 10:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 10:52	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 10:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 10:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 10:52	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 10:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 10:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 10:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 10:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 10:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 10:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 10:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 10:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		04/09/16 10:52	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/09/16 10:52	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 10:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**770**	mg/L	50.0	1		04/08/16 15:59		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-1-FD **Lab ID: 92292932004** Collected: 04/06/16 13:45 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**356**	mg/L	7.0	7		04/13/16 10:00	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		04/12/16 19:12	16984-48-8	
Sulfate	**10.4**	mg/L	1.0	1		04/12/16 19:12	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:08	7440-38-2	
Barium	**137**	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:08	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:08	7440-43-9	
Calcium	**83400**	ug/L	100	1	04/11/16 12:50	04/12/16 17:08	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:08	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 17:08	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:08	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:08	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.3**	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:42	7440-42-8	
Lithium	**28.3**	ug/L	2.5	5	04/11/16 10:25	04/12/16 12:13	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 17:20	04/13/16 17:37	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 11:10	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 11:10	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 11:10	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 11:10	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 11:10	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 11:10	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 11:10	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 11:10	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 11:10	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 11:10	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 11:10	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 11:10	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 11:10	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 11:10	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 11:10	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-1-FD **Lab ID: 92292932004** Collected: 04/06/16 13:45 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 11:10	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 11:10	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 11:10	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 11:10	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 11:10	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 11:10	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 11:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 11:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 11:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 11:10	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 11:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 11:10	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 11:10	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 11:10	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 11:10	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 11:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 11:10	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 11:10	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 11:10	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 11:10	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 11:10	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 11:10	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 11:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 11:10	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 11:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 11:10	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 11:10	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 11:10	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 11:10	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 11:10	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		04/09/16 11:10	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		04/09/16 11:10	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		04/09/16 11:10	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**754**	mg/L	50.0	1		04/08/16 16:00		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-2 **Lab ID: 92292932005** Collected: 04/06/16 16:30 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1230**	mg/L	20.0	20		04/13/16 13:33	16887-00-6	
Fluoride	**0.22**	mg/L	0.10	1		04/12/16 19:34	16984-48-8	
Sulfate	**230**	mg/L	8.0	8		04/13/16 10:28	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**10.6**	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:11	7440-38-2	
Barium	**230**	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:11	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:11	7440-43-9	
Calcium	**192000**	ug/L	1000	10	04/11/16 12:50	04/13/16 14:16	7440-70-2	
Chromium	**5.7**	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7439-92-1	
Molybdenum	**9.5**	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:11	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 17:11	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:11	7440-62-2	
Zinc	**113**	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:11	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**47.3**	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:50	7440-42-8	
Lithium	**117**	ug/L	2.5	5	04/11/16 10:25	04/12/16 12:16	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 17:20	04/13/16 17:40	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 06:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 06:52	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 06:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 06:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 06:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 06:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 06:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 06:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 06:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 06:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 06:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 06:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 06:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 06:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 06:52	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-2 **Lab ID: 92292932005** Collected: 04/06/16 16:30 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 06:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 06:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 06:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 06:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 06:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 06:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 06:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 06:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 06:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 06:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 06:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 06:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 06:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 06:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 06:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 06:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 06:52	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 06:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 06:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 06:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 06:52	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 06:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 06:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 06:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 06:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 06:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 06:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 06:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 06:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 06:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		04/09/16 06:52	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/09/16 06:52	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 06:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2700**	mg/L	250	1		04/11/16 18:33		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: TRIP BLANK **Lab ID: 92292932006** Collected: 04/06/16 07:00 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 04:17	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 04:17	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 04:17	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 04:17	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 04:17	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 04:17	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 04:17	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 04:17	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 04:17	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 04:17	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 04:17	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 04:17	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 04:17	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 04:17	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 04:17	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		04/09/16 04:17	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 04:17	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 04:17	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 04:17	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 04:17	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 04:17	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:17	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:17	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:17	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 04:17	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 04:17	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 04:17	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 04:17	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 04:17	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 04:17	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 04:17	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 04:17	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 04:17	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 04:17	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 04:17	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 04:17	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 04:17	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 04:17	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 04:17	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 04:17	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 04:17	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 04:17	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 04:17	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 04:17	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 04:17	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		04/09/16 04:17	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: TRIP BLANK **Lab ID: 92292932006** Collected: 04/06/16 07:00 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		04/09/16 04:17	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		04/09/16 04:17	2037-26-5	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: AMBIENT BLANK **Lab ID: 92292932007** Collected: 04/06/16 13:00 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		04/12/16 19:56	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 19:56	16984-48-8	
Sulfate	ND	mg/L	1.0	1		04/12/16 19:56	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:15	7440-38-2	
Barium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:15	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:15	7440-43-9	
Calcium	ND	ug/L	100	1	04/11/16 12:50	04/12/16 17:15	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:15	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 17:15	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:15	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:15	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:53	7440-42-8	
Lithium	ND	ug/L	0.50	1	04/11/16 10:25	04/12/16 12:19	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 17:20	04/13/16 17:42	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 04:52	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 04:52	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 04:52	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 04:52	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 04:52	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 04:52	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 04:52	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 04:52	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 04:52	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 04:52	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 04:52	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 04:52	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 04:52	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 04:52	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 04:52	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: AMBIENT BLANK **Lab ID: 92292932007** Collected: 04/06/16 13:00 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 04:52	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 04:52	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 04:52	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 04:52	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 04:52	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 04:52	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:52	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:52	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 04:52	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 04:52	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 04:52	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 04:52	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 04:52	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 04:52	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 04:52	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 04:52	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 04:52	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 04:52	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 04:52	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 04:52	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 04:52	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 04:52	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 04:52	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 04:52	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 04:52	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 04:52	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 04:52	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 04:52	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 04:52	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 04:52	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		04/09/16 04:52	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/09/16 04:52	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		04/09/16 04:52	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**30.0**	mg/L	25.0	1		04/11/16 18:33		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: EQ. BLANK **Lab ID: 92292932008** Collected: 04/06/16 17:00 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		04/12/16 20:18	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 20:18	16984-48-8	
Sulfate	ND	mg/L	1.0	1		04/12/16 20:18	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:18	7440-38-2	
Barium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:18	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 12:50	04/12/16 17:18	7440-43-9	
Calcium	ND	ug/L	100	1	04/11/16 12:50	04/12/16 17:18	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:18	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 12:50	04/12/16 17:18	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 12:50	04/12/16 17:18	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 12:50	04/12/16 17:18	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	04/11/16 10:25	04/11/16 16:56	7440-42-8	
Lithium	ND	ug/L	0.50	1	04/11/16 10:25	04/12/16 12:22	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 18:45	04/14/16 16:21	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/09/16 05:09	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/09/16 05:09	107-13-1	
Benzene	ND	ug/L	1.0	1		04/09/16 05:09	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/09/16 05:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/09/16 05:09	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/09/16 05:09	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/09/16 05:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/09/16 05:09	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/09/16 05:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/09/16 05:09	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/09/16 05:09	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/09/16 05:09	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/09/16 05:09	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/09/16 05:09	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/09/16 05:09	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: EQ. BLANK **Lab ID: 92292932008** Collected: 04/06/16 17:00 Received: 04/07/16 14:27 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/09/16 05:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 05:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/09/16 05:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/09/16 05:09	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/09/16 05:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/09/16 05:09	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/09/16 05:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 05:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/09/16 05:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/09/16 05:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 05:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/09/16 05:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/09/16 05:09	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/09/16 05:09	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/09/16 05:09	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/09/16 05:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/09/16 05:09	108-10-1	
Styrene	ND	ug/L	1.0	1		04/09/16 05:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 05:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/09/16 05:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/09/16 05:09	127-18-4	
Toluene	ND	ug/L	1.0	1		04/09/16 05:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/09/16 05:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/09/16 05:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/09/16 05:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/09/16 05:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/09/16 05:09	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/09/16 05:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/09/16 05:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/09/16 05:09	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		04/09/16 05:09	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/09/16 05:09	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		04/09/16 05:09	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**38.0**	mg/L	25.0	1		04/11/16 18:34		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: GWD/3044 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

METHOD BLANK: 1707225 | Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/12/16 12:14	
Fluoride	mg/L	ND	0.10	04/12/16 12:14	
Sulfate	mg/L	ND	1.0	04/12/16 12:14	

LABORATORY CONTROL SAMPLE: 1707226

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.7	103	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	50	50.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707227 1707228

Parameter	Units	92292667001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.7	50	50	64.2	64.7	101	102	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	98	99	90-110	1	20	
Sulfate	mg/L	5.5	50	50	55.7	56.3	100	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707229 1707230

Parameter	Units	92292932003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	342	50	50	384	386	84	89	90-110	1	20	M6
Fluoride	mg/L	0.13	2.5	2.5	2.5	2.6	97	99	90-110	2	20	
Sulfate	mg/L	10.5	50	50	60.3	61.3	100	102	90-110	2	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: MERP/9234 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007

METHOD BLANK: 1706328 | Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	04/13/16 16:38	

LABORATORY CONTROL SAMPLE: 1706329

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.3	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1706330 1706331

Parameter	Units	92292603002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.5	93	98	75-125	6	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: MERP/9235
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Associated Lab Samples: 92292932008

METHOD BLANK: 1706332
Matrix: Water
Associated Lab Samples: 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	04/14/16 16:16	

LABORATORY CONTROL SAMPLE: 1706333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1706334 1706335

Parameter	Units	92293127001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.4	93	93	75-125	0	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: MPRP/21308 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

METHOD BLANK: 1705910 | Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	04/12/16 16:34	
Arsenic	ug/L	ND	10.0	04/12/16 16:34	
Barium	ug/L	ND	5.0	04/13/16 14:09	
Beryllium	ug/L	ND	1.0	04/12/16 16:34	
Cadmium	ug/L	ND	1.0	04/12/16 16:34	
Calcium	ug/L	ND	100	04/12/16 16:34	
Chromium	ug/L	ND	5.0	04/12/16 16:34	
Cobalt	ug/L	ND	5.0	04/12/16 16:34	
Copper	ug/L	ND	5.0	04/12/16 16:34	
Lead	ug/L	ND	5.0	04/12/16 16:34	
Molybdenum	ug/L	ND	5.0	04/12/16 16:34	
Nickel	ug/L	ND	5.0	04/12/16 16:34	
Selenium	ug/L	ND	10.0	04/12/16 16:34	
Silver	ug/L	ND	5.0	04/12/16 16:34	
Thallium	ug/L	ND	5.4	04/12/16 16:34	
Vanadium	ug/L	ND	5.0	04/12/16 16:34	
Zinc	ug/L	ND	10.0	04/12/16 16:34	

LABORATORY CONTROL SAMPLE: 1705911

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	478	96	80-120	
Arsenic	ug/L	500	464	93	80-120	
Barium	ug/L	500	474	95	80-120	
Beryllium	ug/L	500	472	94	80-120	
Cadmium	ug/L	500	479	96	80-120	
Calcium	ug/L	5000	4760	95	80-120	
Chromium	ug/L	500	478	96	80-120	
Cobalt	ug/L	500	476	95	80-120	
Copper	ug/L	500	480	96	80-120	
Lead	ug/L	500	474	95	80-120	
Molybdenum	ug/L	500	498	100	80-120	
Nickel	ug/L	500	476	95	80-120	
Selenium	ug/L	500	476	95	80-120	
Silver	ug/L	250	242	97	80-120	
Thallium	ug/L	500	469	94	80-120	
Vanadium	ug/L	500	479	96	80-120	
Zinc	ug/L	500	478	96	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1705912 1705913

Parameter	Units	92292995005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	414	418	82	83	75-125	1	25	
Arsenic	ug/L	ND	500	500	409	416	82	83	75-125	2	25	
Barium	ug/L	38.9	500	500	457	462	84	85	75-125	1	25	
Beryllium	ug/L	ND	500	500	417	421	83	84	75-125	1	25	
Cadmium	ug/L	ND	500	500	420	425	84	85	75-125	1	25	
Calcium	ug/L	1980	5000	5000	6120	6120	83	83	75-125	0	25	
Chromium	ug/L	ND	500	500	418	424	83	85	75-125	1	25	
Cobalt	ug/L	ND	500	500	414	419	83	84	75-125	1	25	
Copper	ug/L	ND	500	500	422	428	84	85	75-125	1	25	
Lead	ug/L	ND	500	500	414	421	82	84	75-125	2	25	
Molybdenum	ug/L	ND	500	500	434	440	87	88	75-125	1	25	
Nickel	ug/L	ND	500	500	417	421	83	84	75-125	1	25	
Selenium	ug/L	ND	500	500	420	426	84	85	75-125	1	25	
Silver	ug/L	ND	250	250	215	217	86	87	75-125	1	25	
Thallium	ug/L	ND	500	500	413	417	82	83	75-125	1	25	
Vanadium	ug/L	3.4J	500	500	421	425	84	84	75-125	1	25	
Zinc	ug/L	5.5J	500	500	421	426	83	84	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: MPRP/62523 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 | Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

METHOD BLANK: 2228577 | Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	04/11/16 16:16	
Lithium	ug/L	ND	0.50	04/12/16 11:42	

LABORATORY CONTROL SAMPLE: 2228578

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	83.4	104	80-120	
Lithium	ug/L	80	88.0	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2228579 2228580

Parameter	Units	92292932001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	32.1	80	80	121	118	111	108	75-125	2	20	
Lithium	ug/L	20.7	80	80	105	102	106	101	75-125	4	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: MSV/36304 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92292932005, 92292932006, 92292932007, 92292932008

METHOD BLANK: 1705596 Matrix: Water
Associated Lab Samples: 92292932005, 92292932006, 92292932007, 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1-Dichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,1-Dichloroethene	ug/L	ND	1.0	04/09/16 03:43	
1,2,3-Trichloropropane	ug/L	ND	1.0	04/09/16 03:43	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/09/16 03:43	
1,2-Dichloroethane	ug/L	ND	1.0	04/09/16 03:43	
1,2-Dichloropropane	ug/L	ND	1.0	04/09/16 03:43	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/09/16 03:43	
2-Butanone (MEK)	ug/L	ND	5.0	04/09/16 03:43	
2-Hexanone	ug/L	ND	5.0	04/09/16 03:43	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/09/16 03:43	
Acetone	ug/L	ND	25.0	04/09/16 03:43	
Acrylonitrile	ug/L	ND	10.0	04/09/16 03:43	
Benzene	ug/L	ND	1.0	04/09/16 03:43	
Bromochloromethane	ug/L	ND	1.0	04/09/16 03:43	
Bromodichloromethane	ug/L	ND	1.0	04/09/16 03:43	
Bromoform	ug/L	ND	1.0	04/09/16 03:43	
Bromomethane	ug/L	ND	2.0	04/09/16 03:43	
Carbon disulfide	ug/L	ND	2.0	04/09/16 03:43	
Carbon tetrachloride	ug/L	ND	1.0	04/09/16 03:43	
Chlorobenzene	ug/L	ND	1.0	04/09/16 03:43	
Chloroethane	ug/L	ND	1.0	04/09/16 03:43	
Chloroform	ug/L	ND	1.0	04/09/16 03:43	
Chloromethane	ug/L	ND	1.0	04/09/16 03:43	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 03:43	
cis-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 03:43	
Dibromochloromethane	ug/L	ND	1.0	04/09/16 03:43	
Dibromomethane	ug/L	ND	1.0	04/09/16 03:43	
Ethylbenzene	ug/L	ND	1.0	04/09/16 03:43	
Iodomethane	ug/L	ND	5.0	04/09/16 03:43	
Methylene Chloride	ug/L	ND	1.0	04/09/16 03:43	
Styrene	ug/L	ND	1.0	04/09/16 03:43	
Tetrachloroethene	ug/L	ND	1.0	04/09/16 03:43	
Toluene	ug/L	ND	1.0	04/09/16 03:43	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 03:43	
trans-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 03:43	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	04/09/16 03:43	
Trichloroethene	ug/L	ND	1.0	04/09/16 03:43	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

METHOD BLANK: 1705596 Matrix: Water
Associated Lab Samples: 92292932005, 92292932006, 92292932007, 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	04/09/16 03:43	
Vinyl acetate	ug/L	ND	2.0	04/09/16 03:43	
Vinyl chloride	ug/L	ND	1.0	04/09/16 03:43	
Xylene (Total)	ug/L	ND	2.0	04/09/16 03:43	
1,2-Dichloroethane-d4 (S)	%	102	70-130	04/09/16 03:43	
4-Bromofluorobenzene (S)	%	99	70-130	04/09/16 03:43	
Toluene-d8 (S)	%	100	70-130	04/09/16 03:43	

LABORATORY CONTROL SAMPLE: 1705597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.6	99	80-125	
1,1,1-Trichloroethane	ug/L	50	47.8	96	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	50.1	100	79-124	
1,1,2-Trichloroethane	ug/L	50	46.8	94	85-125	
1,1-Dichloroethane	ug/L	50	47.0	94	73-126	
1,1-Dichloroethene	ug/L	50	49.1	98	66-135	
1,2,3-Trichloropropane	ug/L	50	49.4	99	75-130	
1,2-Dichlorobenzene	ug/L	50	47.5	95	80-133	
1,2-Dichloroethane	ug/L	50	44.2	88	67-128	
1,2-Dichloropropane	ug/L	50	46.6	93	75-132	
1,4-Dichlorobenzene	ug/L	50	48.1	96	78-130	
2-Butanone (MEK)	ug/L	100	99.8	100	61-144	
2-Hexanone	ug/L	100	107	107	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	104	104	72-135	
Acetone	ug/L	100	102	102	48-146	
Acrylonitrile	ug/L	250	284	114	40-160	
Benzene	ug/L	50	47.5	95	80-125	
Bromochloromethane	ug/L	50	45.3	91	71-125	
Bromodichloromethane	ug/L	50	47.0	94	78-124	
Bromoform	ug/L	50	49.5	99	71-128	
Bromomethane	ug/L	50	34.2	68	40-160	
Carbon disulfide	ug/L	50	48.3	97	50-160	
Carbon tetrachloride	ug/L	50	47.9	96	69-131	
Chlorobenzene	ug/L	50	48.2	96	81-122	
Chloroethane	ug/L	50	43.8	88	39-148	
Chloroform	ug/L	50	46.3	93	73-127	
Chloromethane	ug/L	50	44.8	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	46.4	93	74-124	
cis-1,3-Dichloropropene	ug/L	50	47.7	95	72-132	
Dibromochloromethane	ug/L	50	50.3	101	78-125	
Dibromomethane	ug/L	50	45.7	91	82-120	
Ethylbenzene	ug/L	50	47.9	96	79-121	
Iodomethane	ug/L	100	84.9	85	39-154	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

LABORATORY CONTROL SAMPLE: 1705597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	48.8	98	64-133	
Styrene	ug/L	50	48.9	98	84-126	
Tetrachloroethene	ug/L	50	47.1	94	78-122	
Toluene	ug/L	50	46.9	94	80-121	
trans-1,2-Dichloroethene	ug/L	50	48.1	96	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.3	97	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	49.3	99	40-160	
Trichloroethene	ug/L	50	46.5	93	78-122	
Trichlorofluoromethane	ug/L	50	45.0	90	53-137	
Vinyl acetate	ug/L	100	92.6	93	40-160	
Vinyl chloride	ug/L	50	49.2	98	58-137	
Xylene (Total)	ug/L	150	142	95	81-126	
1,2-Dichloroethane-d4 (S)	%			98	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1705598

Parameter	Units	92292398002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	22.0	110	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.8	114	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.7	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.3	102	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.2	111	70-130	
1,1-Dichloroethene	ug/L	ND	20	24.1	120	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.6	108	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.2	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	19.5	97	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.9	104	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.3	107	70-130	
2-Butanone (MEK)	ug/L	ND	40	43.8	109	70-130	
2-Hexanone	ug/L	ND	40	44.5	111	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.3	106	70-130	
Acetone	ug/L	ND	40	44.4	111	70-130	
Acrylonitrile	ug/L	ND	100	124	124	70-130	
Benzene	ug/L	ND	20	22.4	112	70-148	
Bromochloromethane	ug/L	ND	20	20.7	103	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	104	70-130	
Bromoform	ug/L	ND	20	19.6	98	70-130	
Bromomethane	ug/L	ND	20	22.0	110	70-130	
Carbon disulfide	ug/L	ND	20	23.5	118	70-130	
Carbon tetrachloride	ug/L	ND	20	22.6	113	70-130	
Chlorobenzene	ug/L	ND	20	22.3	111	70-146	
Chloroethane	ug/L	ND	20	21.7	109	70-130	
Chloroform	ug/L	ND	20	20.7	104	70-130	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

MATRIX SPIKE SAMPLE: 1705598

Parameter	Units	92292398002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	21.6	108	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.8	109	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.7	104	70-130	
Dibromochloromethane	ug/L	ND	20	20.5	102	70-130	
Dibromomethane	ug/L	ND	20	20.4	102	70-130	
Ethylbenzene	ug/L	ND	20	22.3	111	70-130	
Iodomethane	ug/L	ND	40	44.9	112	70-130	
Methylene Chloride	ug/L	ND	20	21.2	106	70-130	
Styrene	ug/L	ND	20	21.8	109	70-130	
Tetrachloroethene	ug/L	ND	20	21.7	109	70-130	
Toluene	ug/L	ND	20	22.0	110	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.1	111	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	20.8	104	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	19.0	95	70-130	
Trichloroethene	ug/L	ND	20	22.0	110	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.6	113	70-130	
Vinyl acetate	ug/L	ND	40	32.5	81	70-130	
Vinyl chloride	ug/L	ND	20	24.2	121	70-130	
1,2-Dichloroethane-d4 (S)	%				100	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				98	70-130	

SAMPLE DUPLICATE: 1705599

Parameter	Units	92292398003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

SAMPLE DUPLICATE: 1705599

Parameter	Units	92292398003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	100	3		
4-Bromofluorobenzene (S)	%	98	100	2		
Toluene-d8 (S)	%	101	99	2		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: MSV/36305 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004

METHOD BLANK: 1705600 Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1-Dichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,1-Dichloroethene	ug/L	ND	1.0	04/09/16 04:00	
1,2,3-Trichloropropane	ug/L	ND	1.0	04/09/16 04:00	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/09/16 04:00	
1,2-Dichloroethane	ug/L	ND	1.0	04/09/16 04:00	
1,2-Dichloropropane	ug/L	ND	1.0	04/09/16 04:00	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/09/16 04:00	
2-Butanone (MEK)	ug/L	ND	5.0	04/09/16 04:00	
2-Hexanone	ug/L	ND	5.0	04/09/16 04:00	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/09/16 04:00	
Acetone	ug/L	ND	25.0	04/09/16 04:00	
Acrylonitrile	ug/L	ND	10.0	04/09/16 04:00	
Benzene	ug/L	ND	1.0	04/09/16 04:00	
Bromochloromethane	ug/L	ND	1.0	04/09/16 04:00	
Bromodichloromethane	ug/L	ND	1.0	04/09/16 04:00	
Bromoform	ug/L	ND	1.0	04/09/16 04:00	
Bromomethane	ug/L	ND	2.0	04/09/16 04:00	
Carbon disulfide	ug/L	ND	2.0	04/09/16 04:00	
Carbon tetrachloride	ug/L	ND	1.0	04/09/16 04:00	
Chlorobenzene	ug/L	ND	1.0	04/09/16 04:00	
Chloroethane	ug/L	ND	1.0	04/09/16 04:00	
Chloroform	ug/L	ND	1.0	04/09/16 04:00	
Chloromethane	ug/L	ND	1.0	04/09/16 04:00	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 04:00	
cis-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 04:00	
Dibromochloromethane	ug/L	ND	1.0	04/09/16 04:00	
Dibromomethane	ug/L	ND	1.0	04/09/16 04:00	
Ethylbenzene	ug/L	ND	1.0	04/09/16 04:00	
Iodomethane	ug/L	ND	5.0	04/09/16 04:00	
Methylene Chloride	ug/L	ND	1.0	04/09/16 04:00	
Styrene	ug/L	ND	1.0	04/09/16 04:00	
Tetrachloroethene	ug/L	ND	1.0	04/09/16 04:00	
Toluene	ug/L	ND	1.0	04/09/16 04:00	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/09/16 04:00	
trans-1,3-Dichloropropene	ug/L	ND	1.0	04/09/16 04:00	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	04/09/16 04:00	
Trichloroethene	ug/L	ND	1.0	04/09/16 04:00	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

METHOD BLANK: 1705600 Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	04/09/16 04:00	
Vinyl acetate	ug/L	ND	2.0	04/09/16 04:00	
Vinyl chloride	ug/L	ND	1.0	04/09/16 04:00	
Xylene (Total)	ug/L	ND	2.0	04/09/16 04:00	
1,2-Dichloroethane-d4 (S)	%	102	70-130	04/09/16 04:00	
4-Bromofluorobenzene (S)	%	99	70-130	04/09/16 04:00	
Toluene-d8 (S)	%	102	70-130	04/09/16 04:00	

LABORATORY CONTROL SAMPLE: 1705601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.9	102	80-125	
1,1,1-Trichloroethane	ug/L	50	50.4	101	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	50.4	101	79-124	
1,1,2-Trichloroethane	ug/L	50	47.3	95	85-125	
1,1-Dichloroethane	ug/L	50	48.1	96	73-126	
1,1-Dichloroethene	ug/L	50	51.6	103	66-135	
1,2,3-Trichloropropane	ug/L	50	50.5	101	75-130	
1,2-Dichlorobenzene	ug/L	50	48.1	96	80-133	
1,2-Dichloroethane	ug/L	50	44.2	88	67-128	
1,2-Dichloropropane	ug/L	50	47.7	95	75-132	
1,4-Dichlorobenzene	ug/L	50	48.9	98	78-130	
2-Butanone (MEK)	ug/L	100	98.6	99	61-144	
2-Hexanone	ug/L	100	105	105	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	103	103	72-135	
Acetone	ug/L	100	97.1	97	48-146	
Acrylonitrile	ug/L	250	281	112	40-160	
Benzene	ug/L	50	49.5	99	80-125	
Bromochloromethane	ug/L	50	45.5	91	71-125	
Bromodichloromethane	ug/L	50	48.1	96	78-124	
Bromoform	ug/L	50	48.6	97	71-128	
Bromomethane	ug/L	50	37.3	75	40-160	
Carbon disulfide	ug/L	50	51.0	102	50-160	
Carbon tetrachloride	ug/L	50	50.2	100	69-131	
Chlorobenzene	ug/L	50	49.6	99	81-122	
Chloroethane	ug/L	50	45.3	91	39-148	
Chloroform	ug/L	50	46.9	94	73-127	
Chloromethane	ug/L	50	45.2	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.6	95	74-124	
cis-1,3-Dichloropropene	ug/L	50	49.3	99	72-132	
Dibromochloromethane	ug/L	50	50.4	101	78-125	
Dibromomethane	ug/L	50	46.6	93	82-120	
Ethylbenzene	ug/L	50	49.7	99	79-121	
Iodomethane	ug/L	100	88.6	89	39-154	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

LABORATORY CONTROL SAMPLE: 1705601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.3	99	64-133	
Styrene	ug/L	50	50.3	101	84-126	
Tetrachloroethene	ug/L	50	48.9	98	78-122	
Toluene	ug/L	50	49.1	98	80-121	
trans-1,2-Dichloroethene	ug/L	50	50.4	101	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.8	98	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	45.9	92	40-160	
Trichloroethene	ug/L	50	48.6	97	78-122	
Trichlorofluoromethane	ug/L	50	48.8	98	53-137	
Vinyl acetate	ug/L	100	91.4	91	40-160	
Vinyl chloride	ug/L	50	51.8	104	58-137	
Xylene (Total)	ug/L	150	146	97	81-126	
1,2-Dichloroethane-d4 (S)	%			96	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1705602

Parameter	Units	92292290018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.3	102	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.8	109	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.4	97	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.4	97	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.1	105	70-130	
1,1-Dichloroethene	ug/L	ND	20	22.6	113	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	20.2	101	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	19.9	99	70-130	
1,2-Dichloroethane	ug/L	ND	20	18.6	92	70-130	
1,2-Dichloropropane	ug/L	ND	20	20.0	100	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.0	100	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.8	102	70-130	
2-Hexanone	ug/L	ND	40	41.3	103	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.9	100	70-130	
Acetone	ug/L	ND	40	37.7	94	70-130	
Acrylonitrile	ug/L	ND	100	115	115	70-130	
Benzene	ug/L	ND	20	21.3	107	70-148	
Bromochloromethane	ug/L	ND	20	20.0	100	70-130	
Bromodichloromethane	ug/L	ND	20	19.9	99	70-130	
Bromoform	ug/L	ND	20	18.6	93	70-130	
Bromomethane	ug/L	ND	20	21.7	108	70-130	
Carbon disulfide	ug/L	ND	20	22.2	111	70-130	
Carbon tetrachloride	ug/L	ND	20	22.0	110	70-130	
Chlorobenzene	ug/L	ND	20	20.9	105	70-146	
Chloroethane	ug/L	ND	20	19.8	99	70-130	
Chloroform	ug/L	ND	20	20.3	101	70-130	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

MATRIX SPIKE SAMPLE: 1705602

Parameter	Units	92292290018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	20.4	102	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.3	102	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
Dibromochloromethane	ug/L	ND	20	19.7	98	70-130	
Dibromomethane	ug/L	ND	20	19.4	97	70-130	
Ethylbenzene	ug/L	ND	20	21.2	106	70-130	
Iodomethane	ug/L	ND	40	43.9	110	70-130	
Methylene Chloride	ug/L	ND	20	20.3	101	70-130	
Styrene	ug/L	ND	20	20.2	101	70-130	
Tetrachloroethene	ug/L	ND	20	20.3	102	70-130	
Toluene	ug/L	ND	20	21.1	106	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.6	108	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	18.3	92	70-130	
Trichloroethene	ug/L	ND	20	20.8	104	69-151	
Trichlorofluoromethane	ug/L	ND	20	21.3	107	70-130	
Vinyl acetate	ug/L	ND	40	30.2	76	70-130	
Vinyl chloride	ug/L	ND	20	22.8	114	70-130	
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1705603

Parameter	Units	92292290019 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

SAMPLE DUPLICATE: 1705603

Parameter	Units	92292290019 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	105	102	3		
4-Bromofluorobenzene (S)	%	100	98	2		
Toluene-d8 (S)	%	103	101	2		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: WET/44122 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004

METHOD BLANK: 1705709 Matrix: Water
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	04/08/16 15:53	

LABORATORY CONTROL SAMPLE: 1705710

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	230	92	90-110	

SAMPLE DUPLICATE: 1705711

Parameter	Units	92292776003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	280	188	39	5	D6

SAMPLE DUPLICATE: 1705712

Parameter	Units	92292780006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	67.0	56.0	18	5	D6

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: WET/44144 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92292932005, 92292932007, 92292932008

METHOD BLANK: 1706508 | Matrix: Water
Associated Lab Samples: 92292932005, 92292932007, 92292932008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	04/11/16 18:32	

LABORATORY CONTROL SAMPLE: 1706509

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	252	101	90-110	

SAMPLE DUPLICATE: 1706510

Parameter	Units	92293144001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 1706511

Parameter	Units	92292585005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2120	1940	9	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-7 **Lab ID: 92292932001** Collected: 04/06/16 09:55 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.279 ± 0.337 (0.514)** **C:NA T:92%**	pCi/L	04/27/16 19:48	13982-63-3	
Radium-228	EPA 904.0	**0.188 ± 0.457 (1.01)** **C:83% T:85%**	pCi/L	04/27/16 17:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-8 **Lab ID: 92292932002** Collected: 04/06/16 11:40 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.730 ± 0.574 (0.797)** **C:NA T:100%**	pCi/L	04/27/16 20:25	13982-63-3	
Radium-228	EPA 904.0	**0.937 ± 0.479 (0.860)** **C:82% T:84%**	pCi/L	04/27/16 17:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-1 **Lab ID: 92292932003** Collected: 04/06/16 13:25 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.141 ± 0.321 (0.517)** **C:NA T:92%**	pCi/L	04/27/16 20:12	13982-63-3	
Radium-228	EPA 904.0	**0.402 ± 0.442 (0.930)** **C:81% T:89%**	pCi/L	04/27/16 17:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-1-FD **Lab ID: 92292932004** Collected: 04/06/16 13:45 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.127 ± 0.289 (0.466)** **C:NA T:96%**	pCi/L	04/27/16 19:48	13982-63-3	
Radium-228	EPA 904.0	**0.463 ± 0.471 (0.984)** **C:80% T:87%**	pCi/L	04/27/16 17:15	15262-20-1	

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(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: MW-2 **Lab ID: 92292932005** Collected: 04/06/16 16:30 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.94 ± 0.882 (0.896)** **C:NA T:92%**	pCi/L	04/27/16 20:12	13982-63-3	
Radium-228	EPA 904.0	**1.08 ± 0.521 (0.924)** **C:85% T:82%**	pCi/L	04/27/16 17:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: AMBIENT BLANK **Lab ID: 92292932007** Collected: 04/06/16 13:00 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.137 ± 0.380 (0.898) C:NA T:93%**	pCi/L	04/27/16 20:00	13982-63-3	
Radium-228	EPA 904.0	**0.463 ± 0.413 (0.837) C:83% T:76%**	pCi/L	04/27/16 16:47	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Sample: EQ. BLANK **Lab ID: 92292932008** Collected: 04/06/16 17:00 Received: 04/07/16 14:27 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.462 (0.959) C:NA T:90%**	pCi/L	04/27/16 20:36	13982-63-3	
Radium-228	EPA 904.0	**0.0460 ± 0.286 (0.654) C:85% T:90%**	pCi/L	04/27/16 16:47	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: RADC/29041 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

METHOD BLANK: 1062075 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.137 ± 0.313 (0.737) C:NA T:91%	pCi/L	04/27/16 19:34	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

QC Batch: RADC/29040 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92292932001, 92292932002, 92292932003, 92292932004, 92292932005, 92292932007, 92292932008

METHOD BLANK: 1062074 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.143 ± 0.276 (0.608) C:87% T:89%	pCi/L	04/27/16 16:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92292932001	**MW-7**	EPA 300.0	GWD/3044		
92292932002	**MW-8**	EPA 300.0	GWD/3044		
92292932003	**MW-1**	EPA 300.0	GWD/3044		
92292932004	**MW-1-FD**	EPA 300.0	GWD/3044		
92292932005	**MW-2**	EPA 300.0	GWD/3044		
92292932007	**AMBIENT BLANK**	EPA 300.0	GWD/3044		
92292932008	**EQ. BLANK**	EPA 300.0	GWD/3044		
92292932001	**MW-7**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932002	**MW-8**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932003	**MW-1**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932004	**MW-1-FD**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932005	**MW-2**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932007	**AMBIENT BLANK**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932008	**EQ. BLANK**	EPA 3010A	MPRP/21308	EPA 6010	ICP/19171
92292932001	**MW-7**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932002	**MW-8**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932003	**MW-1**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932004	**MW-1-FD**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932005	**MW-2**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932007	**AMBIENT BLANK**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932008	**EQ. BLANK**	EPA 3020	MPRP/62523	EPA 6020B	ICPM/28877
92292932001	**MW-7**	EPA 7470	MERP/9234	EPA 7470	MERC/8876
92292932002	**MW-8**	EPA 7470	MERP/9234	EPA 7470	MERC/8876
92292932003	**MW-1**	EPA 7470	MERP/9234	EPA 7470	MERC/8876
92292932004	**MW-1-FD**	EPA 7470	MERP/9234	EPA 7470	MERC/8876
92292932005	**MW-2**	EPA 7470	MERP/9234	EPA 7470	MERC/8876
92292932007	**AMBIENT BLANK**	EPA 7470	MERP/9234	EPA 7470	MERC/8876
92292932008	**EQ. BLANK**	EPA 7470	MERP/9235	EPA 7470	MERC/8878
92292932001	**MW-7**	EPA 8260	MSV/36305		
92292932002	**MW-8**	EPA 8260	MSV/36305		
92292932003	**MW-1**	EPA 8260	MSV/36305		
92292932004	**MW-1-FD**	EPA 8260	MSV/36305		
92292932005	**MW-2**	EPA 8260	MSV/36304		
92292932006	**TRIP BLANK**	EPA 8260	MSV/36304		
92292932007	**AMBIENT BLANK**	EPA 8260	MSV/36304		
92292932008	**EQ. BLANK**	EPA 8260	MSV/36304		
92292932001	**MW-7**	EPA 903.1	RADC/29041		
92292932002	**MW-8**	EPA 903.1	RADC/29041		
92292932003	**MW-1**	EPA 903.1	RADC/29041		
92292932004	**MW-1-FD**	EPA 903.1	RADC/29041		
92292932005	**MW-2**	EPA 903.1	RADC/29041		
92292932007	**AMBIENT BLANK**	EPA 903.1	RADC/29041		
92292932008	**EQ. BLANK**	EPA 903.1	RADC/29041		
92292932001	**MW-7**	EPA 904.0	RADC/29040		
92292932002	**MW-8**	EPA 904.0	RADC/29040		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92292932

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92292932003	**MW-1**	EPA 904.0	RADC/29040		
92292932004	**MW-1-FD**	EPA 904.0	RADC/29040		
92292932005	**MW-2**	EPA 904.0	RADC/29040		
92292932007	**AMBIENT BLANK**	EPA 904.0	RADC/29040		
92292932008	**EQ. BLANK**	EPA 904.0	RADC/29040		
92292932001	**MW-7**	SM 2540C	WET/44122		
92292932002	**MW-8**	SM 2540C	WET/44122		
92292932003	**MW-1**	SM 2540C	WET/44122		
92292932004	**MW-1-FD**	SM 2540C	WET/44122		
92292932005	**MW-2**	SM 2540C	WET/44144		
92292932007	**AMBIENT BLANK**	SM 2540C	WET/44144		
92292932008	**EQ. BLANK**	SM 2540C	WET/44144		

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Sample Condition Upon Receipt

Client Name: HDR - Charrah Brickhaven

Project WO#: 92292932

92292932

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☑ Yes ☐ No

Date/Initials Person Examining Contents: 4-7-16 KW

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____

Thermometer: ☑ T1505 ☐ 2.5 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** _____ **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	12.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☑ N/A	
Samples checked for dechlorination	☑ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager SCURF Review: JY **Date:** 4/7/16

Project Manager SRF Review: JY **Date:** 4/8/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995514

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HDR	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Cherah - Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- ☐ NPDES
- ☑ GROUND WATER
- ☐ DRINKING WATER
- ☐ UST
- ☐ RCRA
- ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Radium 226/228	metals	8260	TDS	Fluoride	Chloride/sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92292932
1	MW-7					04/06/16	0955		10										2	2	3	1	1	1		001
2	MW-8						1140		11										3	2	3	1	1	1		002
3	MW-1						1325		11										3	2	3	1	1	1		003
4	MW-1-FD						1345		11										3	2	3	1	1	1		004
5	MW-2						1630		11										3	2	3	1	1	1		005
6	Trip Blank						0700		2												2					006
7	Ambient Blank						1300		11										3	2	3	1	1	1		007
8	EQ. Blank						1700		11										3	2	3	1	1	1		008
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Clint Sorrell / PACE	04/06/16	1805	Kenneth Pace HLL	4-7-16	~~1854~~ 2:27	7-16

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 04/06/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

April 19, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on April 08, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

Georgia Certification #: C040
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Charlotte Certification IDs
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs
816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92293140001	**MW-3**	Water	04/07/16 10:05	04/08/16 16:00
92293140002	**MW-4**	Water	04/07/16 12:55	04/08/16 16:00
92293140003	**TRIP BLANK**	Water	04/07/16 07:00	04/08/16 16:00
92293140004	**AMBIENT BLANK**	Water	04/07/16 10:30	04/08/16 16:00
92293140005	**EQ. BLANK**	Water	04/07/16 12:05	04/08/16 16:00

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92293140001	**MW-3**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92293140002	**MW-4**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92293140003	**TRIP BLANK**	EPA 8260	NB	48	PASI-C
92293140004	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92293140005	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	HVK	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92293140001	**MW-3**					
EPA 300.0	Chloride	1270	mg/L	20.0	04/13/16 13:05	
EPA 300.0	Fluoride	0.22	mg/L	0.10	04/12/16 20:40	
EPA 300.0	Sulfate	12.9	mg/L	1.0	04/12/16 20:40	
EPA 6010	Antimony	8.7	ug/L	5.0	04/13/16 19:24	
EPA 6010	Barium	578	ug/L	5.0	04/13/16 19:24	
EPA 6010	Calcium	181000	ug/L	1000	04/14/16 18:32	
EPA 6010	Molybdenum	8.6	ug/L	5.0	04/13/16 19:24	
EPA 6010	Zinc	12.5	ug/L	10.0	04/13/16 19:24	
EPA 6020B	Boron	42.7	ug/L	5.0	04/13/16 13:09	
EPA 6020B	Lithium	217	ug/L	0.50	04/13/16 13:09	
EPA 903.1	Radium-226	0.605 ± 0.566 (0.802) C:NA T:91%	pCi/L		04/18/16 21:40	
EPA 904.0	Radium-228	1.22 ± 0.523 (0.901) C:87% T:88%	pCi/L		04/18/16 12:57	
SM 2540C	Total Dissolved Solids	2530	mg/L	250	04/12/16 11:59	
92293140002	**MW-4**					
EPA 300.0	Chloride	174	mg/L	4.0	04/13/16 11:52	
EPA 300.0	Fluoride	0.42	mg/L	0.10	04/12/16 21:46	
EPA 300.0	Sulfate	3.9	mg/L	1.0	04/12/16 21:46	
EPA 6010	Barium	85.9	ug/L	5.0	04/13/16 19:27	
EPA 6010	Calcium	17900	ug/L	100	04/13/16 19:27	
EPA 6020B	Boron	6.8	ug/L	5.0	04/13/16 13:00	
EPA 6020B	Lithium	18.3	ug/L	0.50	04/13/16 13:00	
EPA 903.1	Radium-226	0.444 ± 0.463 (0.653) C:NA T:90%	pCi/L		04/18/16 22:13	
EPA 904.0	Radium-228	0.0190 ± 0.380 (0.873) C:85% T:77%	pCi/L		04/18/16 12:57	
SM 2540C	Total Dissolved Solids	513	mg/L	25.0	04/12/16 11:59	
92293140004	**AMBIENT BLANK**					
EPA 903.1	Radium-226	-0.089 ± 0.406 (0.827) C:NA T:88%	pCi/L		04/18/16 21:51	
EPA 904.0	Radium-228	0.375 ± 0.383 (0.797) C:86% T:87%	pCi/L		04/18/16 12:57	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92293140005	**EQ. BLANK**					
EPA 903.1	Radium-226	0.0924 ± 0.422 (0.858) C:NA T:89%	pCi/L		04/18/16 22:00	
EPA 904.0	Radium-228	0.360 ± 0.421 (0.892) C:87% T:81%	pCi/L		04/18/16 12:57	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: MW-3 **Lab ID: 92293140001** Collected: 04/07/16 10:05 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1270**	mg/L	20.0	20		04/13/16 13:05	16887-00-6	
Fluoride	**0.22**	mg/L	0.10	1		04/12/16 20:40	16984-48-8	
Sulfate	**12.9**	mg/L	1.0	1		04/12/16 20:40	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**8.7**	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:24	7440-38-2	
Barium	**578**	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:24	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:24	7440-43-9	
Calcium	**181000**	ug/L	1000	10	04/11/16 23:50	04/14/16 18:32	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7439-92-1	
Molybdenum	**8.6**	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:24	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 23:50	04/13/16 19:24	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:24	7440-62-2	
Zinc	**12.5**	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:24	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**42.7**	ug/L	5.0	1	04/12/16 13:22	04/13/16 13:09	7440-42-8	
Lithium	**217**	ug/L	0.50	1	04/12/16 13:22	04/13/16 13:09	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 18:45	04/14/16 16:56	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/14/16 05:14	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/14/16 05:14	107-13-1	
Benzene	ND	ug/L	1.0	1		04/14/16 05:14	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/14/16 05:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/14/16 05:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/14/16 05:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/14/16 05:14	74-83-9	M1
2-Butanone (MEK)	ND	ug/L	5.0	1		04/14/16 05:14	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/14/16 05:14	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/14/16 05:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/14/16 05:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/14/16 05:14	75-00-3	M1
Chloroform	ND	ug/L	1.0	1		04/14/16 05:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/14/16 05:14	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/14/16 05:14	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: MW-3 **Lab ID: 92293140001** Collected: 04/07/16 10:05 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/14/16 05:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 05:14	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 05:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/14/16 05:14	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/14/16 05:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/14/16 05:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/14/16 05:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 05:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 05:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/14/16 05:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 05:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 05:14	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/14/16 05:14	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/14/16 05:14	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/14/16 05:14	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		04/14/16 05:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/14/16 05:14	108-10-1	
Styrene	ND	ug/L	1.0	1		04/14/16 05:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 05:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 05:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/14/16 05:14	127-18-4	
Toluene	ND	ug/L	1.0	1		04/14/16 05:14	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/14/16 05:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/14/16 05:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/14/16 05:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/14/16 05:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/14/16 05:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/14/16 05:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/14/16 05:14	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/14/16 05:14	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		04/14/16 05:14	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		04/14/16 05:14	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		04/14/16 05:14	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2530**	mg/L	250	1		04/12/16 11:59		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: MW-4 **Lab ID: 92293140002** Collected: 04/07/16 12:55 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**174**	mg/L	4.0	4		04/13/16 11:52	16887-00-6	
Fluoride	**0.42**	mg/L	0.10	1		04/12/16 21:46	16984-48-8	
Sulfate	**3.9**	mg/L	1.0	1		04/12/16 21:46	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:27	7440-38-2	
Barium	**85.9**	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:27	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:27	7440-43-9	
Calcium	**17900**	ug/L	100	1	04/11/16 23:50	04/13/16 19:27	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:27	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 23:50	04/13/16 19:27	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:27	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:27	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.8**	ug/L	5.0	1	04/12/16 13:22	04/13/16 13:00	7440-42-8	
Lithium	**18.3**	ug/L	0.50	1	04/12/16 13:22	04/13/16 13:00	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 18:45	04/14/16 16:59	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/14/16 05:31	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/14/16 05:31	107-13-1	
Benzene	ND	ug/L	1.0	1		04/14/16 05:31	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/14/16 05:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/14/16 05:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/14/16 05:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/14/16 05:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/14/16 05:31	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/14/16 05:31	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/14/16 05:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/14/16 05:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/14/16 05:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/14/16 05:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/14/16 05:31	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/14/16 05:31	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: MW-4 **Lab ID: 92293140002** Collected: 04/07/16 12:55 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/14/16 05:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 05:31	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 05:31	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/14/16 05:31	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/14/16 05:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/14/16 05:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/14/16 05:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 05:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 05:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/14/16 05:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 05:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 05:31	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/14/16 05:31	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/14/16 05:31	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/14/16 05:31	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/14/16 05:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/14/16 05:31	108-10-1	
Styrene	ND	ug/L	1.0	1		04/14/16 05:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 05:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 05:31	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/14/16 05:31	127-18-4	
Toluene	ND	ug/L	1.0	1		04/14/16 05:31	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/14/16 05:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/14/16 05:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/14/16 05:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/14/16 05:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/14/16 05:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/14/16 05:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/14/16 05:31	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/14/16 05:31	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		04/14/16 05:31	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/14/16 05:31	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		04/14/16 05:31	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**513**	mg/L	25.0	1		04/12/16 11:59		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: TRIP BLANK **Lab ID: 92293140003** Collected: 04/07/16 07:00 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/14/16 06:06	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/14/16 06:06	107-13-1	
Benzene	ND	ug/L	1.0	1		04/14/16 06:06	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/14/16 06:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/14/16 06:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/14/16 06:06	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/14/16 06:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/14/16 06:06	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/14/16 06:06	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/14/16 06:06	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/14/16 06:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/14/16 06:06	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/14/16 06:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/14/16 06:06	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/14/16 06:06	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		04/14/16 06:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 06:06	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 06:06	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/14/16 06:06	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/14/16 06:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/14/16 06:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/14/16 06:06	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 06:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 06:06	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/14/16 06:06	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/14/16 06:06	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/14/16 06:06	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/14/16 06:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/14/16 06:06	108-10-1	
Styrene	ND	ug/L	1.0	1		04/14/16 06:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 06:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 06:06	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/14/16 06:06	127-18-4	
Toluene	ND	ug/L	1.0	1		04/14/16 06:06	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/14/16 06:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/14/16 06:06	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/14/16 06:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/14/16 06:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/14/16 06:06	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/14/16 06:06	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/14/16 06:06	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/14/16 06:06	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		04/14/16 06:06	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: TRIP BLANK **Lab ID: 92293140003** Collected: 04/07/16 07:00 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/14/16 06:06	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		04/14/16 06:06	2037-26-5	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: AMBIENT BLANK **Lab ID: 92293140004** Collected: 04/07/16 10:30 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		04/12/16 22:09	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 22:09	16984-48-8	
Sulfate	ND	mg/L	1.0	1		04/12/16 22:09	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:30	7440-38-2	
Barium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:30	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:30	7440-43-9	
Calcium	ND	ug/L	100	1	04/11/16 23:50	04/13/16 19:30	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:30	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 23:50	04/13/16 19:30	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:30	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:30	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	04/12/16 13:22	04/13/16 13:03	7440-42-8	
Lithium	ND	ug/L	0.50	1	04/12/16 13:22	04/13/16 13:03	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 18:45	04/14/16 17:01	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/14/16 06:23	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/14/16 06:23	107-13-1	
Benzene	ND	ug/L	1.0	1		04/14/16 06:23	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/14/16 06:23	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/14/16 06:23	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/14/16 06:23	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/14/16 06:23	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/14/16 06:23	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/14/16 06:23	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/14/16 06:23	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/14/16 06:23	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/14/16 06:23	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/14/16 06:23	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/14/16 06:23	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/14/16 06:23	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: AMBIENT BLANK **Lab ID: 92293140004** Collected: 04/07/16 10:30 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/14/16 06:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 06:23	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 06:23	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/14/16 06:23	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/14/16 06:23	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/14/16 06:23	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/14/16 06:23	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 06:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 06:23	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/14/16 06:23	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/14/16 06:23	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/14/16 06:23	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/14/16 06:23	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/14/16 06:23	108-10-1	
Styrene	ND	ug/L	1.0	1		04/14/16 06:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 06:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 06:23	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/14/16 06:23	127-18-4	
Toluene	ND	ug/L	1.0	1		04/14/16 06:23	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/14/16 06:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/14/16 06:23	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/14/16 06:23	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/14/16 06:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/14/16 06:23	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/14/16 06:23	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/14/16 06:23	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/14/16 06:23	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		04/14/16 06:23	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		04/14/16 06:23	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		04/14/16 06:23	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		04/12/16 11:59		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: EQ. BLANK **Lab ID: 92293140005** Collected: 04/07/16 12:05 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		04/12/16 22:31	16887-00-6	
Fluoride	ND	mg/L	0.10	1		04/12/16 22:31	16984-48-8	
Sulfate	ND	mg/L	1.0	1		04/12/16 22:31	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-36-0	
Arsenic	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:33	7440-38-2	
Barium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-39-3	
Beryllium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:33	7440-41-7	
Cadmium	ND	ug/L	1.0	1	04/11/16 23:50	04/13/16 19:33	7440-43-9	
Calcium	ND	ug/L	100	1	04/11/16 23:50	04/13/16 19:33	7440-70-2	
Chromium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-47-3	
Cobalt	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-48-4	
Copper	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-50-8	
Lead	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7439-98-7	
Nickel	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-02-0	
Selenium	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:33	7782-49-2	
Silver	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-22-4	
Thallium	ND	ug/L	5.4	1	04/11/16 23:50	04/13/16 19:33	7440-28-0	
Vanadium	ND	ug/L	5.0	1	04/11/16 23:50	04/13/16 19:33	7440-62-2	
Zinc	ND	ug/L	10.0	1	04/11/16 23:50	04/13/16 19:33	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	04/12/16 13:22	04/13/16 13:06	7440-42-8	
Lithium	ND	ug/L	0.50	1	04/12/16 13:22	04/13/16 13:06	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	04/11/16 18:45	04/14/16 17:04	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		04/14/16 06:40	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		04/14/16 06:40	107-13-1	
Benzene	ND	ug/L	1.0	1		04/14/16 06:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		04/14/16 06:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/14/16 06:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/14/16 06:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/14/16 06:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/14/16 06:40	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		04/14/16 06:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		04/14/16 06:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/14/16 06:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/14/16 06:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/14/16 06:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/14/16 06:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		04/14/16 06:40	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: EQ. BLANK **Lab ID: 92293140005** Collected: 04/07/16 12:05 Received: 04/08/16 16:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		04/14/16 06:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 06:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/14/16 06:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		04/14/16 06:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/14/16 06:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/14/16 06:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/14/16 06:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/14/16 06:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 06:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/16 06:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		04/14/16 06:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		04/14/16 06:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		04/14/16 06:40	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		04/14/16 06:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/14/16 06:40	108-10-1	
Styrene	ND	ug/L	1.0	1		04/14/16 06:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 06:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/16 06:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/14/16 06:40	127-18-4	
Toluene	ND	ug/L	1.0	1		04/14/16 06:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/14/16 06:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/14/16 06:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/14/16 06:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/14/16 06:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/14/16 06:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/14/16 06:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/14/16 06:40	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/14/16 06:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		04/14/16 06:40	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		04/14/16 06:40	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		04/14/16 06:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		04/12/16 12:00		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: GWD/3044 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 1707225 | Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/12/16 12:14	
Fluoride	mg/L	ND	0.10	04/12/16 12:14	
Sulfate	mg/L	ND	1.0	04/12/16 12:14	

LABORATORY CONTROL SAMPLE: 1707226

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.7	103	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	50	50.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707227 1707228

Parameter	Units	92292667001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.7	50	50	64.2	64.7	101	102	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	98	99	90-110	1	20	
Sulfate	mg/L	5.5	50	50	55.7	56.3	100	102	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1707229 1707230

Parameter	Units	92292932003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	342	50	50	384	386	84	89	90-110	1	20	M6
Fluoride	mg/L	0.13	2.5	2.5	2.5	2.6	97	99	90-110	2	20	
Sulfate	mg/L	10.5	50	50	60.3	61.3	100	102	90-110	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: MERP/9235 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 1706332 Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	04/14/16 16:16	

LABORATORY CONTROL SAMPLE: 1706333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1706334 1706335

Parameter	Units	92293127001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.4	93	93	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: MPRP/21326 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 1706990 | Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	04/13/16 18:20	
Arsenic	ug/L	ND	10.0	04/13/16 18:20	
Barium	ug/L	ND	5.0	04/13/16 18:20	
Beryllium	ug/L	ND	1.0	04/13/16 18:20	
Cadmium	ug/L	ND	1.0	04/13/16 18:20	
Calcium	ug/L	ND	100	04/13/16 18:20	
Chromium	ug/L	ND	5.0	04/13/16 18:20	
Cobalt	ug/L	ND	5.0	04/13/16 18:20	
Copper	ug/L	ND	5.0	04/13/16 18:20	
Lead	ug/L	ND	5.0	04/13/16 18:20	
Molybdenum	ug/L	ND	5.0	04/13/16 18:20	
Nickel	ug/L	ND	5.0	04/13/16 18:20	
Selenium	ug/L	ND	10.0	04/13/16 18:20	
Silver	ug/L	ND	5.0	04/13/16 18:20	
Thallium	ug/L	ND	5.4	04/13/16 18:20	
Vanadium	ug/L	ND	5.0	04/13/16 18:20	
Zinc	ug/L	ND	10.0	04/13/16 18:20	

LABORATORY CONTROL SAMPLE: 1706991

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	454	91	80-120	
Arsenic	ug/L	500	433	87	80-120	
Barium	ug/L	500	469	94	80-120	
Beryllium	ug/L	500	468	94	80-120	
Cadmium	ug/L	500	459	92	80-120	
Calcium	ug/L	5000	4670	93	80-120	
Chromium	ug/L	500	465	93	80-120	
Cobalt	ug/L	500	449	90	80-120	
Copper	ug/L	500	461	92	80-120	
Lead	ug/L	500	450	90	80-120	
Molybdenum	ug/L	500	476	95	80-120	
Nickel	ug/L	500	457	91	80-120	
Selenium	ug/L	500	445	89	80-120	
Silver	ug/L	250	232	93	80-120	
Thallium	ug/L	500	459	92	80-120	
Vanadium	ug/L	500	461	92	80-120	
Zinc	ug/L	500	445	89	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1706992 1706993

Parameter	Units	92293126001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	430	439	86	87	75-125	2	25	
Arsenic	ug/L	ND	500	500	414	423	83	85	75-125	2	25	
Barium	ug/L	22.8	500	500	462	466	88	89	75-125	1	25	
Beryllium	ug/L	ND	500	500	441	446	88	89	75-125	1	25	
Cadmium	ug/L	ND	500	500	430	439	86	88	75-125	2	25	
Calcium	ug/L	29400	5000	5000	32800	33500	68	82	75-125	2	25	M1
Chromium	ug/L	ND	500	500	435	441	87	88	75-125	1	25	
Cobalt	ug/L	ND	500	500	413	422	83	84	75-125	2	25	
Copper	ug/L	ND	500	500	431	440	86	88	75-125	2	25	
Lead	ug/L	ND	500	500	419	427	84	85	75-125	2	25	
Molybdenum	ug/L	2.9J	500	500	452	461	90	92	75-125	2	25	
Nickel	ug/L	ND	500	500	420	428	84	85	75-125	2	25	
Selenium	ug/L	ND	500	500	425	432	85	86	75-125	2	25	
Silver	ug/L	ND	250	250	219	224	88	90	75-125	2	25	
Thallium	ug/L	ND	500	500	425	431	84	86	75-125	1	25	
Vanadium	ug/L	ND	500	500	442	447	88	89	75-125	1	25	
Zinc	ug/L	12.2	500	500	427	434	83	84	75-125	2	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: MPRP/62542 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 2229318 Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	04/13/16 12:54	
Lithium	ug/L	ND	0.50	04/13/16 12:54	

LABORATORY CONTROL SAMPLE: 2229319

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	80	90.3	113	80-120	
Lithium	ug/L	80	95.3	119	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2229320 2229321

Parameter	Units	92293140001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	42.7	80	80	130	129	109	108	75-125	1	20	
Lithium	ug/L	217	80	80	293	297	95	100	75-125	1	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: MSV/36352 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92293140001, 92293140002, 92293140003, 92293140004, 92293140005

METHOD BLANK: 1709167 Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140003, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/14/16 04:57	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/14/16 04:57	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/14/16 04:57	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/14/16 04:57	
1,1-Dichloroethane	ug/L	ND	1.0	04/14/16 04:57	
1,1-Dichloroethene	ug/L	ND	1.0	04/14/16 04:57	
1,2,3-Trichloropropane	ug/L	ND	1.0	04/14/16 04:57	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/14/16 04:57	
1,2-Dichloroethane	ug/L	ND	1.0	04/14/16 04:57	
1,2-Dichloropropane	ug/L	ND	1.0	04/14/16 04:57	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/14/16 04:57	
2-Butanone (MEK)	ug/L	ND	5.0	04/14/16 04:57	
2-Hexanone	ug/L	ND	5.0	04/14/16 04:57	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/14/16 04:57	
Acetone	ug/L	ND	25.0	04/14/16 04:57	
Acrylonitrile	ug/L	ND	10.0	04/14/16 04:57	
Benzene	ug/L	ND	1.0	04/14/16 04:57	
Bromochloromethane	ug/L	ND	1.0	04/14/16 04:57	
Bromodichloromethane	ug/L	ND	1.0	04/14/16 04:57	
Bromoform	ug/L	ND	1.0	04/14/16 04:57	
Bromomethane	ug/L	ND	2.0	04/14/16 04:57	
Carbon disulfide	ug/L	ND	2.0	04/14/16 04:57	
Carbon tetrachloride	ug/L	ND	1.0	04/14/16 04:57	
Chlorobenzene	ug/L	ND	1.0	04/14/16 04:57	
Chloroethane	ug/L	ND	1.0	04/14/16 04:57	
Chloroform	ug/L	ND	1.0	04/14/16 04:57	
Chloromethane	ug/L	ND	1.0	04/14/16 04:57	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/14/16 04:57	
cis-1,3-Dichloropropene	ug/L	ND	1.0	04/14/16 04:57	
Dibromochloromethane	ug/L	ND	1.0	04/14/16 04:57	
Dibromomethane	ug/L	ND	1.0	04/14/16 04:57	
Ethylbenzene	ug/L	ND	1.0	04/14/16 04:57	
Iodomethane	ug/L	ND	5.0	04/14/16 04:57	
Methylene Chloride	ug/L	ND	1.0	04/14/16 04:57	
Styrene	ug/L	ND	1.0	04/14/16 04:57	
Tetrachloroethene	ug/L	ND	1.0	04/14/16 04:57	
Toluene	ug/L	ND	1.0	04/14/16 04:57	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/14/16 04:57	
trans-1,3-Dichloropropene	ug/L	ND	1.0	04/14/16 04:57	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	04/14/16 04:57	
Trichloroethene	ug/L	ND	1.0	04/14/16 04:57	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

METHOD BLANK: 1709167 Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140003, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	04/14/16 04:57	
Vinyl acetate	ug/L	ND	2.0	04/14/16 04:57	
Vinyl chloride	ug/L	ND	1.0	04/14/16 04:57	
Xylene (Total)	ug/L	ND	2.0	04/14/16 04:57	
1,2-Dichloroethane-d4 (S)	%	101	70-130	04/14/16 04:57	
4-Bromofluorobenzene (S)	%	99	70-130	04/14/16 04:57	
Toluene-d8 (S)	%	100	70-130	04/14/16 04:57	

LABORATORY CONTROL SAMPLE: 1709168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	52.8	106	80-125	
1,1,1-Trichloroethane	ug/L	50	52.2	104	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	48.8	98	79-124	
1,1,2-Trichloroethane	ug/L	50	50.1	100	85-125	
1,1-Dichloroethane	ug/L	50	50.3	101	73-126	
1,1-Dichloroethene	ug/L	50	53.7	107	66-135	
1,2,3-Trichloropropane	ug/L	50	51.9	104	75-130	
1,2-Dichlorobenzene	ug/L	50	52.5	105	80-133	
1,2-Dichloroethane	ug/L	50	50.0	100	67-128	
1,2-Dichloropropane	ug/L	50	50.6	101	75-132	
1,4-Dichlorobenzene	ug/L	50	52.5	105	78-130	
2-Butanone (MEK)	ug/L	100	97.7	98	61-144	
2-Hexanone	ug/L	100	104	104	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	110	110	72-135	
Acetone	ug/L	100	101	101	48-146	
Acrylonitrile	ug/L	250	292	117	40-160	
Benzene	ug/L	50	51.9	104	80-125	
Bromochloromethane	ug/L	50	53.1	106	71-125	
Bromodichloromethane	ug/L	50	53.5	107	78-124	
Bromoform	ug/L	50	49.9	100	71-128	
Bromomethane	ug/L	50	39.2	78	40-160	
Carbon disulfide	ug/L	50	54.8	110	50-160	
Carbon tetrachloride	ug/L	50	56.1	112	69-131	
Chlorobenzene	ug/L	50	51.7	103	81-122	
Chloroethane	ug/L	50	58.6	117	39-148	
Chloroform	ug/L	50	52.5	105	73-127	
Chloromethane	ug/L	50	48.0	96	44-146	
cis-1,2-Dichloroethene	ug/L	50	51.6	103	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.1	100	72-132	
Dibromochloromethane	ug/L	50	51.6	103	78-125	
Dibromomethane	ug/L	50	51.3	103	82-120	
Ethylbenzene	ug/L	50	52.8	106	79-121	
Iodomethane	ug/L	100	75.2	75	39-154	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

LABORATORY CONTROL SAMPLE: 1709168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	50.3	101	64-133	
Styrene	ug/L	50	52.2	104	84-126	
Tetrachloroethene	ug/L	50	51.4	103	78-122	
Toluene	ug/L	50	53.4	107	80-121	
trans-1,2-Dichloroethene	ug/L	50	52.2	104	71-127	
trans-1,3-Dichloropropene	ug/L	50	50.4	101	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	45.1	90	40-160	
Trichloroethene	ug/L	50	50.5	101	78-122	
Trichlorofluoromethane	ug/L	50	53.3	107	53-137	
Vinyl acetate	ug/L	100	110	110	40-160	
Vinyl chloride	ug/L	50	53.1	106	58-137	
Xylene (Total)	ug/L	150	157	104	81-126	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			103	70-130	

MATRIX SPIKE SAMPLE: 1709169

Parameter	Units	92293140001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.3	112	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.3	96	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.9	99	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.1	106	70-130	
1,1-Dichloroethene	ug/L	ND	20	23.1	115	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	20.6	103	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
1,2-Dichloroethane	ug/L	ND	20	20.9	104	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.1	106	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.6	103	70-130	
2-Butanone (MEK)	ug/L	ND	40	42.2	105	70-130	
2-Hexanone	ug/L	ND	40	41.9	105	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	45.7	114	70-130	
Acetone	ug/L	ND	40	43.9	110	70-130	
Acrylonitrile	ug/L	ND	100	118	118	70-130	
Benzene	ug/L	ND	20	22.3	111	70-148	
Bromochloromethane	ug/L	ND	20	21.5	108	70-130	
Bromodichloromethane	ug/L	ND	20	21.4	107	70-130	
Bromoform	ug/L	ND	20	17.9	89	70-130	
Bromomethane	ug/L	ND	20	11.3	56	70-130	M1
Carbon disulfide	ug/L	ND	20	23.8	119	70-130	
Carbon tetrachloride	ug/L	ND	20	22.8	114	70-130	
Chlorobenzene	ug/L	ND	20	20.7	103	70-146	
Chloroethane	ug/L	ND	20	26.2	131	70-130	M1
Chloroform	ug/L	ND	20	21.5	108	70-130	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

MATRIX SPIKE SAMPLE: 1709169

Parameter	Units	92293140001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	19.1	95	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.7	108	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.1	101	70-130	
Dibromochloromethane	ug/L	ND	20	20.1	100	70-130	
Dibromomethane	ug/L	ND	20	21.8	109	70-130	
Ethylbenzene	ug/L	ND	20	21.3	106	70-130	
Iodomethane	ug/L	ND	40	17.6	44	70-130	M1
Methylene Chloride	ug/L	ND	20	21.0	105	70-130	
Styrene	ug/L	ND	20	20.7	103	70-130	
Tetrachloroethene	ug/L	ND	20	20.1	100	70-130	
Toluene	ug/L	ND	20	22.1	110	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	22.3	111	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.4	97	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	14.5	73	70-130	
Trichloroethene	ug/L	ND	20	21.9	109	69-151	
Trichlorofluoromethane	ug/L	ND	20	25.0	125	70-130	
Vinyl acetate	ug/L	ND	40	30.3	76	70-130	
Vinyl chloride	ug/L	ND	20	24.5	123	70-130	
1,2-Dichloroethane-d4 (S)	%				103	70-130	
4-Bromofluorobenzene (S)	%				97	70-130	
Toluene-d8 (S)	%				102	70-130	

SAMPLE DUPLICATE: 1709170

Parameter	Units	92293140002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

SAMPLE DUPLICATE: 1709170

Parameter	Units	92293140002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	103	101	2		
4-Bromofluorobenzene (S)	%	98	96	2		
Toluene-d8 (S)	%	99	99	0		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: WET/44164 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 1707332 | Matrix: Water
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	04/12/16 11:56	

LABORATORY CONTROL SAMPLE: 1707333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 1707334

Parameter	Units	92293023011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1080	1090	1	5	

SAMPLE DUPLICATE: 1707335

Parameter	Units	92293168003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: MW-3 **Lab ID: 92293140001** Collected: 04/07/16 10:05 Received: 04/08/16 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.605 ± 0.566 (0.802)** **C:NA T:91%**	pCi/L	04/18/16 21:40	13982-63-3	
Radium-228	EPA 904.0	**1.22 ± 0.523 (0.901)** **C:87% T:88%**	pCi/L	04/18/16 12:57	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: MW-4 **Lab ID: 92293140002** Collected: 04/07/16 12:55 Received: 04/08/16 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.444 ± 0.463 (0.653)** **C:NA T:90%**	pCi/L	04/18/16 22:13	13982-63-3	
Radium-228	EPA 904.0	**0.0190 ± 0.380 (0.873)** **C:85% T:77%**	pCi/L	04/18/16 12:57	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: AMBIENT BLANK **Lab ID: 92293140004** Collected: 04/07/16 10:30 Received: 04/08/16 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.089 ± 0.406 (0.827) C:NA T:88%**	pCi/L	04/18/16 21:51	13982-63-3	
Radium-228	EPA 904.0	**0.375 ± 0.383 (0.797) C:86% T:87%**	pCi/L	04/18/16 12:57	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Sample: EQ. BLANK **Lab ID: 92293140005** Collected: 04/07/16 12:05 Received: 04/08/16 16:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0924 ± 0.422 (0.858) C:NA T:89%**	pCi/L	04/18/16 22:00	13982-63-3	
Radium-228	EPA 904.0	**0.360 ± 0.421 (0.892) C:87% T:81%**	pCi/L	04/18/16 12:57	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: RADC/28903 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 1058304 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0862 ± 0.394 (0.234) C:NA T:96%	pCi/L	04/18/16 13:37	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

QC Batch: RADC/28911 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92293140001, 92293140002, 92293140004, 92293140005

METHOD BLANK: 1058312 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.391 ± 0.351 (0.711) C:90% T:74%	pCi/L	04/18/16 13:00	

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92293140

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92293140001	**MW-3**	EPA 300.0	GWD/3044		
92293140002	**MW-4**	EPA 300.0	GWD/3044		
92293140004	**AMBIENT BLANK**	EPA 300.0	GWD/3044		
92293140005	**EQ. BLANK**	EPA 300.0	GWD/3044		
92293140001	**MW-3**	EPA 3010A	MPRP/21326	EPA 6010	ICP/19164
92293140002	**MW-4**	EPA 3010A	MPRP/21326	EPA 6010	ICP/19164
92293140004	**AMBIENT BLANK**	EPA 3010A	MPRP/21326	EPA 6010	ICP/19164
92293140005	**EQ. BLANK**	EPA 3010A	MPRP/21326	EPA 6010	ICP/19164
92293140001	**MW-3**	EPA 3020	MPRP/62542	EPA 6020B	ICPM/28912
92293140002	**MW-4**	EPA 3020	MPRP/62542	EPA 6020B	ICPM/28912
92293140004	**AMBIENT BLANK**	EPA 3020	MPRP/62542	EPA 6020B	ICPM/28912
92293140005	**EQ. BLANK**	EPA 3020	MPRP/62542	EPA 6020B	ICPM/28912
92293140001	**MW-3**	EPA 7470	MERP/9235	EPA 7470	MERC/8878
92293140002	**MW-4**	EPA 7470	MERP/9235	EPA 7470	MERC/8878
92293140004	**AMBIENT BLANK**	EPA 7470	MERP/9235	EPA 7470	MERC/8878
92293140005	**EQ. BLANK**	EPA 7470	MERP/9235	EPA 7470	MERC/8878
92293140001	**MW-3**	EPA 8260	MSV/36352		
92293140002	**MW-4**	EPA 8260	MSV/36352		
92293140003	**TRIP BLANK**	EPA 8260	MSV/36352		
92293140004	**AMBIENT BLANK**	EPA 8260	MSV/36352		
92293140005	**EQ. BLANK**	EPA 8260	MSV/36352		
92293140001	**MW-3**	EPA 903.1	RADC/28903		
92293140002	**MW-4**	EPA 903.1	RADC/28903		
92293140004	**AMBIENT BLANK**	EPA 903.1	RADC/28903		
92293140005	**EQ. BLANK**	EPA 903.1	RADC/28903		
92293140001	**MW-3**	EPA 904.0	RADC/28911		
92293140002	**MW-4**	EPA 904.0	RADC/28911		
92293140004	**AMBIENT BLANK**	EPA 904.0	RADC/28911		
92293140005	**EQ. BLANK**	EPA 904.0	RADC/28911		
92293140001	**MW-3**	SM 2540C	WET/44164		
92293140002	**MW-4**	SM 2540C	WET/44164		
92293140004	**AMBIENT BLANK**	SM 2540C	WET/44164		
92293140005	**EQ. BLANK**	SM 2540C	WET/44164		

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Page 2 of 2 for Internal Use ONLY

Sample Condition Upon Receipt

Client Name: HDR

Proje WO# : 92293140

92293140

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☐ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: DMS 4/7

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other:____

Thermometer: ☐ T1505 ☐ ____ **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 2.5 **Biological Tissue Frozen?** ☐ Yes ☐ No ☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				COMMENTS:
Chain of Custody Present?	☐ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☐ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☐ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☐ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☐ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☐ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☐ No	☐ N/A	7.
Sufficient Volume?	☐ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☐ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☐ Yes	☐ No	☐ N/A	
Containers Intact?	☐ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☐ N/A	11. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☐ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☐ N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☐ N/A	
Samples checked for dechlorination	☐ Yes	☐ No	☐ N/A	14.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☐ N/A	15.
Trip Blank Present?	☐ Yes	☐ No	☐ N/A	16.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: ____ Date/Time: ____

Comments/Resolution: ____

Project Manager SCURF Review: MS **Date:** 4/8/16

Project Manager SRF Review: VJ **Date:** 4/11/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995516

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: HDR	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Charah - Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Radium 226/228	Metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92293140
1	MW-3		G			04/07/16	1005		11										3	2	3	1	1	1		001
2	MW-4						1255		11										3	2	3	1	1	1		002
3	Trip Blank						0700		2												2					003
4	Ambient Blank						1030		11										3	2	3	1	1	1		004
5	EQ. Blank						1205		11										3	2	3	1	1	1		005
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	04/07/16	1600	Jennie Pace HH	4/7	1600	2.5	Y	N	U

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 04/07/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

C

Appendix C – 4th, 5th, & 6th Round Electronic Data Deliverables

440 S Church Street, Suite 1000
Charlotte, NC 28202-2075
704.338.6700

hdrinc.com

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DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Green Meadows - Charah, Inc.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Michael Plummer, P.E. Phone: 704 338-6843

E-mail: michael.plummer@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Charah, Inc. Brickhaven No. 2 Mine Tract "A"	1271 Moncure-Flatwood Road Chatham County Moncure, North Carolina	1910-STRUC-2015	CAMA	July 11, 2016

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☒ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ Other(specify) _____

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Michael Plummer — Facility Representative Name (Print)
Project Manager — Title
704 338-6843 — (Area Code) Telephone Number

Signature — Date: 9/9/2016

Affix NC Licensed/Professional Engineer Seal

NORTH CAROLINA PROFESSIONAL SEAL 025495 ENGINEER MICHAEL D. PLUMMER 9/9/16

HDR Engineering, Inc. of the Carolinas; 440 S. Church St. Suite 1000 Charlotte, NC 28202
Facility Representative Address

F-0116
NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

Background Sampling Report

Brickhaven No.2 Mine Tract “A” Structural Fill

Charah, Inc.

Moncure, Chatham County, North Carolina

September 9, 2016

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List of Acronyms

µg/L	micrograms per liter
asl	above sea level
CAMA	North Carolina Coal Ash Management Act of 2014
CCP	Coal Combustion Products
EPA	United States Environmental Protection Agency
ft/ft	feet / foot
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCGPS	North Carolina groundwater protection standard
NTU	Nephelometric turbidity units
msl	mean sea level
PVC	polyvinyl chloride
TDS	total dissolved solids
USGS	U.S. Geological Survey

1. Introduction

1.1 Purpose

This *Background Sampling Report* addresses results from the 7th and 8th Round events as well as the overall statistical results of the eight required sampling events at the Brickhaven No.2 Mine Tract "A" Structural Fill site in Moncure, Chatham County, North Carolina.

Groundwater monitoring and sampling prior to, during, and post-disposal of coal combustion products (CCPs) into the previously clay mined pits of the site shall be conducted in accordance with the following:

- Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729, ratified by North Carolina General Assembly)
- Water Quality Monitoring Plan Brickhaven No.2 Mine Tract "A" Structural Fill, approved March 2015.
- North Carolina Department of Environmental Quality (NCDEQ)[1] Permit No. 1910-STRUC-2015, issued June 5, 2015.
- NCDEQ Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling, April 2008.
- NCDEQ Division of Water Management memorandum concerning electronic document submittal for routine groundwater and surface water monitoring, November 5, 2014.
- U.S. Environmental Protection Agency (EPA) Region I, *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells*, January 19, 2010.

Per the approved permits and water quality monitoring plan, a minimum of eight groundwater monitoring events will be conducted at site over the course of one year, concluding on or about August 2016. A minimum of one independent background sample prior to placement of ash was specified in the permit to construct/operate.

The first sampling event occurred on August 12, 2015 and was addressed in detail in the *Initial Background Groundwater and Surface Water Monitoring Event Report* prepared by Buxton Environmental, Inc. (Buxton) on October 28, 2015. The 2nd and 3rd sampling events commenced on October 15, 2015 and November 18, 2015, respectively; these sampling events were addressed in detail in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* prepared by HDR Engineering of the Carolinas, Inc. (HDR) on December 31, 2015. The 1st and 2nd sampling events occurred prior to the placement of ash on October 23, 2015 and represent pre-existing site conditions. The 4th, 5th, and 6th sampling events commenced on January 4, February 16, and April 5, 2016, respectively; these sampling events were addressed in detail in the *2016 First Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* prepared by HDR on May 17, 2016 (HDR 2016a).

[1] Prior to September 18, 2015, the NCDEQ was referred to as the North Carolina Department of Environment and Natural Resources (NCDENR). Both naming conventions are used in this report, as appropriate.

The 7th and final 8th sampling events commenced on May 25 and July 11, 2016, respectively. The results of the 7th and 8th sampling events with overall statistical results of the eight required events are described herein.

1.2 Regulatory Background

CAMA Section §130A-309.216 requires implementation of a groundwater monitoring system as described in the requirements as follows:

"§ 130A-309.216. Design, construction, and siting requirements for projects using coal combustion products for structural fill.

(b) Liners, Leachate Collection System, Cap, and Groundwater Monitoring System Required for Large Structural Fills. –

(4) A groundwater monitoring system, that shall be approved by the Department and, at a minimum, consists of all of the following:

a. A sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer that represent the quality of groundwater passing the relevant point of compliance as approved by the Department. A down-gradient monitoring system shall be installed at the relevant point of compliance so as to ensure detection of groundwater contamination in the uppermost aquifer.

b. A proposed monitoring plan, which shall be certified by a licensed geologist or professional engineer to be effective in providing early detection of any release of hazardous constituents from any point in a structural fill or leachate surface impoundment to the uppermost aquifer, so as to be protective of public health, safety, and welfare; the environment; and natural resources.

c. A groundwater monitoring program, which shall include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and down-gradient wells. Monitoring shall be conducted through construction and the post-closure care period. The sampling procedures and frequency shall be protective of public health, safety, and welfare; the environment; and natural resources.

d. A detection monitoring program for all Appendix I constituents. For purposes of this subdivision, the term "Appendix I" means Appendix I to 40 C.F.R. Part 258, "Appendix I Constituents for Detection Monitoring," including subsequent amendments and editions.

e. An assessment monitoring program and corrective action plan if one or more of the constituents listed in Appendix I is detected in exceedance of a groundwater protection standard."

On April 17, 2015, EPA published its final rule *Disposal of Coal Combustion Residuals from Electric Utilities* to regulate the disposal of CCP as solid waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA). Among other requirements, the final rule established requirements for a groundwater monitoring program consisting of detection monitoring and, if necessary, assessment monitoring and corrective action. EPA selected constituents for detection monitoring that are present in CCP, would be expected to migrate rapidly, and would thereby provide early detection as to whether contaminants were migrating from the disposal unit (80 FR 74: 21397).

As stated in the Federal Register (80 FR 74: 21342)

> *These detection monitoring constituents or inorganic indicator parameters are: boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS). These inorganic indicator parameters are known to be leading indicators of releases of contaminants associated with CCR and the Agency strongly recommends that State Directors add these constituents to the list of indicator parameters to be monitored during detection monitoring of groundwater if and when a MSWLF decides to accept CCR.*

Groundwater analytical results for the constituents in 40 CFR 257, Appendix III detection monitoring and 40 CFR 257, Appendix IV assessment monitoring are included below.

Constituents for detection monitoring listed in 40 CFR 257 Appendix III are:

- Boron
- Calcium
- Chloride
- Fluoride
- pH
- Sulfate
- Total dissolved solids (TDS)

Constituents for assessment monitoring listed in 40 CFR 257 Appendix IV includes:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Fluoride
- Lead
- Lithium
- Mercury

- Molybdenum
- Selenium
- Thallium
- Radium 226 and 228 combined

Aluminum, copper, iron, manganese, and sulfide were included in the Appendix IV constituents in the draft rule; EPA removed these constituents in the final rule. Therefore, these constituents are not included.

1.2.1 Site Specific Regulatory Background

In accordance with CAMA, the *Water Quality Monitoring Plan* (Buxton, 2015a) for the site was designed to effectively provide early detection of any release, as to be protective of human health and the environment. The *Design Hydrogeologic Report* (HDR, 2014*)* specified a groundwater monitoring network would comprise of seven downgradient/side-gradient monitoring wells and one upgradient background monitoring well. Four pre-existing piezometers (PZM-1, PZM-22, PZM-27, and PZM-28) were to be converted to monitoring wells (MW-4, MW-5, MW-7, and MW-8, respectively); PZM-28 remained dry during investigations and was unable to be utilized for monitoring well MW-8 as originally specified. PZM-28 was subsequently abandoned in accordance with North Carolina standards and its abandonment was documented in the *Report of Abandonment of Piezometer PZM-28,* submitted to NCDEQ on October 5, 2015. Therefore, only MW-4, MW-5, and MW-7 were successfully converted to monitoring wells during the August through December 2015 time period (**Table 1**).

Four downgradient/side-gradient compliance monitoring wells (MW-2, MW-3, MW-6, and MW-8 replacement) and one upgradient background monitoring well (MW-1) were installed from June 19 through July 30, 2015. On July 17, 2015, Mr. Ross Klingman, P.G. with Buxton, contacted Ms. Elizabeth Werner, Permitting Hydrogeologist with NCDEQ SWS, via telephone to request the installation of an additional background monitoring well (BG-1). The additional background well would assist with current background and future semi-annual groundwater quality monitoring at the site. During the conversation, Ms. Werner verbally approved the installation of the additional background monitoring well (Buxton, 2015b).

1.3 Site Location, Operation and Background

The site is located in Chatham County, approximately four miles southwest of central Moncure, North Carolina (**Figure 1**). The owner of the site is Green Meadow, LLC (Green Meadow) and Charah, Inc. (Charah) is responsible for the operation and maintenance of the site. The mine property is approximately 301 acres in total; the structural fill area for CCP placement will comprise of approximately 145 acres; and the fill area including associated perimeter berms, channels, and haul roads encompasses 166 acres. The remaining acreage is still utilized for clay mining activities.

The property located within the structural fill area was previously owned by General Shale Brick, Inc., which operated the site as a clay mine since 1985 for their off-site brick manufacturing facility. Mined clay was stockpiled and then transported approximately 3.5 miles south to Brickhaven, North Carolina for brick manufacturing.

The area immediately surrounding the site primarily consists of rural residential (approximately 2,500 feet east, 1,000 feet southeast and 1,000 feet southwest), commercial, industrial, wooded and agricultural property. According to information obtained from the Chatham County GIS website, municipal water supply is available to the surrounding area.

Charah began CCP placement in the first composite liner containment system (Cell 1, Subcell 1A) on October 23, 2015. Charah plans to place approximately 1,600,000 tons of CCP per year in the 12,000,000 ton structural fill capacity; therefore, the placement phase should last approximately eight years or less depending of importation rate. CCPs (including fly ash, bottom ash, boiler slag, and/or flue gas desulfurization materials) are brought to the site by truck, rail, or combination thereof, from the Duke Energy Carolinas (DEC) Riverbend Steam Station and Duke Energy Progress (DEP) L.V. Sutton Energy Complex (Sutton Plant) sites. CCPs could eventually be brought to the site from other DEC and/or DEP sites.

Leachate (i.e. product generated from the liquids present in the fill at the time of placement and/or stormwater that infiltrates the fill) is managed on-site through collection, storage, and disposal of the resultant liquid. Green Meadow LLC has an approved pump and haul permit to dispose of leachate at either the City of Sanford's Big Buffalo Creek Wastewater Treatment Plant or to VLS Recovery Services LLC in Mauldin, South Carolina. In addition to the first leachate sample initially collected during the 3rd Round Sampling Event (HDR, 2015), leachate samples were subsequently collected during the 4th through 8th sampling events; analytical leachate results are discussed in **Section 3.3**.

1.4 Site Topography and Geographical Setting

According to the 1993 USGS topographic quadrangle (**Figure 2**), the topography of the site and immediately surrounding area can be characterized by moderately rolling hills, which are dissected by dendritic creeks. The northwestern portion of the site generally slopes to the north and northwest from three topographically high ridges with interconnected saddles ranging from approximately 260 to 270 feet above sea level (asl), towards off-site intermittent tributary. The southeastern portion of the site generally slopes to the southeast, south and west from the three topographic high ridges with similar interconnected saddles ranging from approximately 260 to 270 feet asl, towards on-site intermittent tributary creeks that drain from the southern property boundary at approximately 205 feet asl.

1.5 Geologic and Hydrogeologic Setting

1.5.1 Regional Geology

The site is located within the Piedmont physiographical province of North Carolina, which is a northeast-southwest trending region extending from New York to Alabama.

According to the 1985 North Carolina Geologic Map prepared by the North Carolina Geological Survey, the site is located in the Triassic Basin Belt of the Piedmont physiographic province. The basement rocks of the Triassic Basin Belt include conglomerate, sandstone, mudstone, limestone, coal, and shale. The majority of the subject property is located within the Sanford Formation which contains conglomerate, fanglomerate, sandstone, and mudstone. The far

western portion of the site is located in the Cummock Formation which contains sandstone, mudstone, gray and black coal, and carbonaceous shale. The Triassic Basin is bounded by felsic metavolcanic rock within the Carolina Slate Belt approximately 6.5 miles to the northwest; and is contacted by metamorphosed granite and by biotite gneiss and schist of the Raleigh Belt along a normal fault approximately 2.5 miles to the southeast. The Triassic Basin formations have been intruded by north northwest-south southeast trending igneous diabase dikes during the Jurassic Period (~144 to 208 Ma), and contain northeast-southwest trending normal faults, however, none of these were indicated to exist at the subject site on the 1985 geologic map (NCDENR, 1985).

In the Piedmont, the bedrock is typically overlain by a mantle of weathered rock (residuum/saprolite), which has an average thickness of approximately 25 feet. The residuum/saprolite consists of varying amounts of unconsolidated clays, silts and sands, with lesser amounts of rock fragments. Due to the range of the parent rock composition and the variable susceptibility to weathering of each rock type, the residuum/saprolite ranges widely in color, texture and thickness. Generally, the residuum/saprolite is thickest near inter-stream divides (ridges) and thins toward stream beds. In profile, the residuum/saprolite normally grades from clayey soils near the land surface to sandier, partially weathered rock above the competent bedrock (Buxton, 2014).

1.5.2 Regional Hydrogeology

The occurrence and movement of groundwater in the Piedmont physiographic province is within two separate but interconnected water-bearing zones that typically comprise one aquifer. A shallow water-bearing zone occurs within the residuum/saprolite and a deeper zone within the underlying bedrock.

Groundwater in the residuum/saprolite zone occurs in the interstitial pore spaces between the individual grains comprising the residuum/saprolite. Groundwater in this zone is typically under water table conditions and generally flows from topographic highs to topographic lows. The occurrence and movement of groundwater in the underlying bedrock zone is controlled by joints and fractures within the bedrock. Groundwater within this deeper zone may occur under confined or semi-confined conditions, depending on the extent of fracturing at the saprolite/bedrock interface. Deeper groundwater movement is typically controlled by the distribution of openings in the bedrock and can be variable.

No naturally occurring springs or creeks with actively flowing water recharged by the subsurface aquifer were observed within the site boundary during this reporting period.

2 Sampling Procedures

2.1 Groundwater Sampling Procedures

A total of eight monitoring wells, one background monitoring well, and two surface water samples were collected on three separate occasions in 2015 and five separate occasions in 2016, to date (**Figure 3**). All sampling events have been now conducted prior to August 2016 in compliance of the site's Water Quality Monitoring Plan. The 1st and 2nd monitoring events

(August 12, 2015 and October 15, 2015 respectively) occurred prior to the placement of ash at the site on October 23, 2015 and therefore constitute pre-existing site conditions. The 3rd monitoring event (November 18, 2015) and each subsequent event since has occurred after the placement of CCP. A single leachate sample was collected during each of the 3rd through 8th monitoring events. The 1st monitoring event was conducted by Buxton; the 2nd through 8th monitoring events were conducted by Pace Analytical Services, Inc. Field data sheets and sampling logs along with the analytical laboratory results for the 7th and 8th monitoring events are provided in **Appendices A, B, and C**. Analytical laboratory results for the first through 3rd monitoring events were included under separate cover in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015) while results for the 4th through 6th events were included in the *2016 First Semi-Annual Groundwater* S*urface Water, and Leachate Sampling Report* (HDR, 2016a).

Prior to commencing groundwater sampling, new plastic sheeting was placed around the well head, in order to prevent the sampling equipment from contacting the ground surface. The well lock was then removed from the protective stand-up-cover. New nitrile gloves were donned and static groundwater levels were obtained from below the measuring point (top-of-well polyvinyl chloride (PVC) casing) at each monitoring well to the nearest 0.01 foot with a depth-to-water electrode at each monitoring well. Low flow purging and sampling was conducted utilizing a stainless-steel Proactive SS Mega Monsoon pump with flow rate controller, which was plumbed to new polyethylene sample tubing (1/2-inch outer diameter (OD) 3/8-inch inner diameter (ID)). In the event of low recharge a peristaltic pump was utilized to purge and sample the well. The base of the pump was set at approximately two feet off the bottom depth above the well base to reduce turbidity. The following information was recorded at timed intervals during the purging process: 1) water levels (below top of casing), 2) purge flow rate, 3) purge rate and cumulative water pumped, and 4) field parameters. Temperature, conductivity, pH, oxygen reduction potential (ORP), and dissolved oxygen (DO) were recorded with a Horiba U-52 meter; and turbidity was recorded with a Micro-TPW meter. The Horiba U-52 and Micro-TPW meters were rented and calibrated by Enviro-Equipment, Inc. of Pineville, North Carolina for the first monitoring event. Horiba U-52 and Micro-TPW/LaMotte turbidity meters, property of Pace Analytical, were calibrated prior to use and on-site during the sampling events.

Purging was conducted until a minimum of three well volumes of water had been removed and the below field parameters requirements have been met and stabilized. All measurements, except turbidity, were obtained using a flow-through-cell, while turbidity measurements are obtained before water enters the flow-through-cell.

- Turbidity (10% for values greater than 5 NTU (if three turbidity values are less than 5 NTU, the values are considered stabilized)
- DO (10% for values greater than 0.5 mg/L, if three DO values are less than 0.5 mg/L, the values are considered stabilized)
- Specific conductance (3%)
- Temperature (3%)
- pH ($\pm$ 0.1 unit)

- ORP ($\pm$ 10 millivolts)

If field parameters had stabilized prior to purging three well volumes, or the well was going dry, groundwater samples were then collected. The water level meter and low flow pump were decontaminated in the field with a distilled water rinse, Alconox® wash, and a distilled water rinse, prior to and following sampling at each monitoring well. Following sampling, locks were placed back on the well stand-up covers. Purge water was discharged to the ground surface at respective well heads.

All samples for this current reporting period were shipped under proper management and Chain of Custody (COC) procedures to Pace Analytical Services, Inc. laboratory in Huntersville, North Carolina (Cert IDs #37706 and #5342). Sample handling and custody was performed according to the EPA Guidance for Field Samplers.

2.2 Surface Water Sampling Procedures

Surface water samples were collected from two locations outside of the structural fill boundary to provide for potential groundwater to surface water interactions and evaluation of potential off-site impacts. The SW-1 sampling location is downgradient of the site, approximately 3,000 feet south of the structural fill boundary along an unnamed tributary of Gulf Creek. The SW-2 sampling location is upgradient of the site, approximately 3,200 feet west of the structural fill boundary along Shaddox Creek. Approximate surface water sampling locations are depicted on **Figure 4**.

New nitrile gloves were donned prior to collecting surface water samples. Field parameters (including temperature, conductivity, pH, ORP, and DO) were recorded with a Horiba U-52 meter; turbidity was recorded with a Micro-TPW meter.

Gulf Creek and Shaddox Creek are classified as Class WS-IV Waters by NCDEQ and as such are evaluated under North Carolina Surface Water and Wetland Standards (15A NCAC 02B).

3 Results

Groundwater analytical results for the constituents in 40 CFR 257 Appendix III detection monitoring and 40 CFR 257 Appendix IV assessment monitoring (as previously discussed in **Section 1.2**) were compared to background concentrations to determine if any impact to groundwater is indicated. If any impact to groundwater is inferred from groundwater detection monitoring or if a potential impact is detected, Charah must notify NCDEQ of any exceedance(s) within 14 days. In the event no exceedances are observed, Charah must submit a report of the sampling results to NCDEQ with 120 days of the sampling event.

Groundwater samples were also analyzed for constituents of assessment monitoring (EPA 40 CFR 257 Appendix IV). Assessment monitoring typically occurs if a statistically significant increase in a detection monitoring constituent is noted and will be further assessed in subsequent reporting. Appendix IV constituents were analyzed for background events and will continue to be assessed during future semi-annual monitoring events. Groundwater monitoring

samples were also analyzed for 40 CFR Part 258 Appendix I metals and volatile organic compounds (VOCs). Iron and manganese, two constituents often attributable to weathering of Piedmont parent material, were not analyzed during testing.

A summary of the laboratory parameters detected during the 7th and 8th monitoring events, along with the highest detected concentration result, is provided in the sections below. Field and Sampling Logs are provided in **Appendix A**. Full laboratory data from the 7th and 8th monitoring events is provided in **Appendix B** and electronic data deliverables (EDDs) in **Appendix C**.

3.1 Groundwater Analytical Results

3.1.1 Background Site Conditions Summary

Pre-CCP Placement groundwater site conditions (i.e. laboratory analysis from the first and second monitoring events) generally exhibited high background chloride and TDS concentrations. Several monitoring wells additionally showed exceedances of NC 2L Standards for antimony, barium, chromium, cobalt, copper, and vanadium.

Bromodichloromethane and dibromochloromethane detected above NCGPS in groundwater samples from MW-2, MW-3, and MW-7 during the first monitoring event were the result of municipal water utilized during previous development activities. These trihalomethanes were only detected in the first sampling event; all VOCs were non-detect for the second through 8th sampling events. VOCs are not present at naturally occurring background concentrations at the site.

A detailed discussion of background groundwater conditions can be found in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015). **Section 4.0** of this report will further discuss statistical results of the cumulative 8 rounds for a better understanding of predictive limits for the background well location BG-1 as well as Interwell interactions.

3.1.2 Conditions Following CCP Placement

CCP placement began at the site on October 23, 2015; six monitoring events (3rd through 8th rounds) have been conducted following CCP placement. The 3rd monitoring event was discussed in detail in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015); while the 4th through 6th was discussed in detail in the *2016 First Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2016a); the primary focus of this section is the analytical results of Rounds 7 and Round 8.

The eight monitoring wells and single background monitoring well continue to show consistently elevated chloride and TDS which was also observed in pre-CCP placement (Rounds 1 and 2) and following CCP placement (3rd Round). In Rounds 3 through Round 8, antimony, arsenic, barium, chromium, thallium, vanadium and pH additionally showed several intermittent exceedances that were similarly noted in both pre-CCP placement monitoring events (Rounds 1 and 2). Naturally occurring metals exceeding NCGPS are common in North Carolina due to various geologic conditions (i.e. weathering of crystalline parent material). pH levels were

detected below NCGPS in MW-4 (6.30 to 6.50 SU) for all six post-CCR placement monitoring events and appear to be the result of naturally occurring conditions.

Ranges of constituent concentrations for Rounds 3 through Round 8 are given below. The monitoring well location of the highest concentration and the sampling event in which the concentration was detected for a given constituent is provided in parentheses. Data packages are included in **Appendix B** with EDDs in **Appendix C**. A summary of the findings from the 7th through 8th monitoring events is provided below and in **Table 6-1** and **Table 6-2**:

EPA Appendix III Constituent Detections (Post-CCP Placement Site Conditions)

- Boron: 5.5 to 49.4 µg/L (MW-7 – 3rd Round)
- Calcium: 9,990 to 207,000 µg/L (MW-2 – 5th Round)
- Chloride: 17,600 to 1,280,000 µg/L (MW-3 – 5th Round)
- Fluoride: <20 to 590 µg/L (MW-5 – 3rd Round)
- pH: 6.30 to 7.95 SU
- Sulfate: 10,900 to 247,000 µg/L (MW-2 – 5th Round)
- Total Dissolved Solids: 194,000 to 3,290,000 µg/L (MW-2 – 8th Round)

EPA Appendix IV Constituent Detections (Post-CCP Placement Site Conditions)

- Antimony: <3.8 to 12.3 µg/L (MW-2 – 7th Round)
- Barium: 86 to 1,550 µg/L (MW-8 – 3rd Round)
- Chromium: <2.50 µg/L to 23.7 µg/L (MW-2 – 5th Round)
- Lithium: 6.3 µg/L to 356 µg/L (MW-2 – 8th Round)
- Molybdenum: <2.50 µg/L to 21.1 µg/L (MW-2 – 3rd Round)
- Thallium: <5.0 µg/L to 14.8 µg/L (MW-5 – 5th Round)
- Radium-226: 0.0638J to 1.16 pCi/L (MW-8 – 3rd Round)
- Radium-228: 0.174J to 1.95J pCi/L (MW-3 – 3rd Round)

EPA Appendix I Metal Detections (Post-CCP Placement Site Conditions)

- Nickel: <2.5 µg/L to 13.5 (MW-2 – 5th Round)
- Vanadium: <2.5 µg/L to 6.2 µg/L (MW-1 – 4th Round)
- Zinc: <5.0 µg/L to 50.7 (MW-2 – 3rd Round)

EPA Appendix I VOC Detections (Post-CCP Placement Site Conditions)

- All VOCs have been reported as ND in all wells for 3rd through 8th Rounds

Antimony increased slightly during the 7th Round at MW-2, but remained consistent with only slight changes from 8.9 to 12.3 µg/L. Laboratory analytical results from the 7th and 8th Round generally showed a decrease or remained constant in groundwater TDS concentrations in all monitoring wells with the exception of MW-2. TDS concentrations increased for the three subsequent sampling events (4th, 5th and 6th Rounds) and returned to levels similarly observed during pre-CCP placement (1st and 2nd Rounds). Kevin Godwin, Project Manager of Pace Analytical, verified the 3rd Round sampling, analytical, and quality control procedures were performed in accordance with all other monitoring events.

3.2 Surface Water Analytical Results

Surface water samples (**Figure 4**) prior to and following CCP placement had few constituents above established North Carolina Surface Water and Wetland Standards (15A NCAC 02B) or EPA National Criteria standards (utilized by North Carolina Division of Water Quality as default standards for non listed parameters). Laboratory analytical results from the 7th Round of sampling indicated pH and copper in surface water samples SW-1 (5.8 SU) and SW-1 (7.9 µg/L) were in exceedance of their respective 15A NCAC 2B standard. No other surface water exceedances were detected during the 4th Round of sampling. Results from the 5th Round of sampling indicated cobalt (19.1 µg/L) in SW-2 was in exceedance of its respective 15A NCAC 2B standards. No detections above the 15A NCAC 2B standards were observed during the 6th Round of surface water sampling.

3.3 Leachate Analytical Results

Leachate generated on-site was collected during the 7th through 8th monitoring events to geochemically characterize the nature of CCP leachate (**Figure 5**). Leachate parameter concentrations are evaluated against the NC Groundwater Protection Standards. EPA Appendix III parameters generally increased from the 3rd through 7th Rounds but were within the standard. Round 8 reported boron (1,150 µg/L), sulfate (276,000 µg/L) and TDS (711,000 µg/L) exceedances for EPA Appendix III parameters. EPA Appendix IV and EPA Appendix I metals parameters remained stable or also increased slightly. Antimony, selenium and vanadium were in exceedance during the 7th and 8th Rounds, while arsenic and chromium were in exceedance for the only the 8th Round.

3.4 Groundwater Flow Characteristics

Prior to each of 7th Round and 8th Round sampling events, a synoptic event occurred to establish depth-to-water below top of casing for the seven monitoring wells, one upgradient monitoring well, and one background monitoring well. Depths-to-water ranged from 6.78 feet below top of casing (MW-6; May 25, 2016) to 58.57 feet below top of casing (MW-1; July 11, 2016). Groundwater elevations ranged from 199.82 mean sea level (msl) (MW-8; July 11, 2016) to 224.1 msl (MW-6; July 11, 2016). The greatest groundwater elevation change observed between Round 4 through Round 6 events occurred at MW-5 (230.1 msl on January 4, 220.1 msl on April 5, 2016; an approximate 10 foot drop in three months). Due to on-site linear construction and storm water pond construction, groundwater levels have fluctuated during this reporting period. This has remained constant since that construction related activities.

3.4.1 Groundwater Direction

Groundwater generally flows toward the southeastern portion of the site, although radial flow away from two topographic high points is depicted on **Figure 6**. A potentiometric surface map for groundwater elevations measured during July 2016 event is shown in **Table 2** and **Figure 6**.

3.4.2 Hydraulic Conductivity

Hydraulic conductivity is the capacity of a porous medium to transmit water (K, coefficient of permeability). This property is primarily dependent upon the size, shape, and interconnectedness of pores, and is governed secondarily by the properties of the fluid (i.e.,

viscosity, a temperature-dependent phenomenon). Horizontal hydraulic conductivity of aquifer materials adjacent to the well screen was estimated through in-situ slug testing. On September 10, 2015, Buxton conducted rising head slug tests at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8, to determine hydraulic conductivity (Buxton, 2015b). Results are provided in **Table 3**.

Prior to conducting slug tests, static water levels were obtained at each well to the nearest one-hundredth of a foot (0.01 feet) with an electronic water level indicator. Slug tests were conducted by lowering one or two disposable PVC bailer(s) attached to new nylon rope below the water level at each well. Water levels were allowed to equilibrate to near static conditions (at least 90% recharge). A slug of water was then removed from the well by withdrawing the bailer(s) and water levels were measured with time.

The slug and recovery test data were evaluated using AQTESOLV® software developed by Hydrosolv, Inc. (2007) and in accordance with the methods developed by Bouwer and Rice in 1976 and 1987. The Bouwer-Rice method utilized to evaluate the slug test data was developed to determine the hydraulic conductivity of the aquifer immediately surrounding the screened portion of the partially or fully penetrating wells in unconfined aquifers.

Monitoring wells were generally screened within residuum or partially weathered rock; hydraulic conductivity ranged from 4.08E-07 cm/sec at MW-3 (0.422 ft/year) to 4.11E-04 at MW-1 (425.5 ft/year).

3.4.3 Horizontal Hydraulic Gradients

Horizontal hydraulic gradient is calculated by taking the difference in hydraulic head over the length of the flow path between two wells of similar construction; BG-1, MW-1, MW-2, MW-3, MW-6, and MW-8 were installed with 15-foot screens, while MW-4, MW-5, and MW-7 (i.e. converted piezometers) were installed with ten-foot screens. Hydraulic gradients at the site during the 8th Round of sampling ranged from 0.001 between MW-1 and MW-6 (as well as other pairings) to 0.02 between MW-7 and MW-8 (**Table 4**).

3.4.4 Groundwater Flow Velocity

Darcy's Law is an equation that describes the flow rate or flux of fluid through a porous media. To calculate the velocity that moves through a porous media, the specific discharge, or Darcy flux, is divided by the effective porosity, P_e. The result is the average linear velocity, or seepage velocity, of groundwater between two points.

The following equation was used to calculate groundwater velocities between specific wells:

$$V_S = \frac{Ki}{P_e}$$

Where:

V_s = seepage velocity
K = horizontal hydraulic conductivity
i = horizontal hydraulic gradient
P_e = effective porosity

Seepage velocities for groundwater were calculated using horizontal hydraulic gradients established in **Section 3.2.3**, horizontal hydraulic conductivity values established in **Section 3.2.2**, and estimated effective porosity values from geotechnical testing and from the literature where geotechnical data was not available. (Buxton, 2014; Sinhal and Gupta, 2010). If geotechnical data was unavailable, an effective porosity of 0.15 was used for wells primarily screened in residuum/PWR and an effective porosity of 0.075 was used for wells primarily screened in layered rock/PWR.

Flow velocity varies with hydraulic conductivity as well as hydraulic gradient and effective porosity of the soil, and therefore this approximated value varies on a well-by-well basis. Throughout the study area, flow velocity ranged from nearly 0.0 feet per year (between MW-2 and MW-3 as wells as between MW-3 and MW-7) to approximately 36.6 feet per year (between MW-1 and MW-8). The site average flow velocity is approximately three feet per year for the evaluated screen intervals. Flow velocity values are summarized in **Table 5**; flow velocity was estimated with the most recent groundwater level measurements (July 11, 2016).

4 Statistics

4.1 Methodology

An analysis of the data set including the recent sampling event was performed. The data was statistically analyzed using a combination of Starpoint Software, Inc.'s ChemPoint® and ChemStat® as well as EPA's ProUCL statistical software packages. Prediction Limits (PL) and proposed site standards for constituents measured in background well BG-1 for the Site were developed in accordance with Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance. Additionally, Interwell statistical analysis was conducted for the detected groundwater results during the July 2016 sampling event in the Brickhaven No. 2 Mine Tract "A" Structure Fill Site.

The statistical summary for each parameter and well is included in **Appendix D**. The data analysis includes the following.

- Test for Outliers
- Adjustment of Non-Detects (NDs)
- Distribution Assessment
- Trend Analysis
- Prediction Limits
- Interwell Comparison

A more detailed report can be provided upon request.

4.1.1 Test for Outliers

Parameters measured during prior sampling events and the most recent monitoring period (i.e., the entire record for a parameter pooled over the 8 downgradient wells and the background well) are tested for outliers using Dixon's test (valid for sample sizes < 25). Any values identified as outliers are noted in a statistical summary table included in **Appendix D** in more detail.

However, outliers are not removed from subsequent analyses unless the analytical result's quality assurance review determined that values in question were impacted and sources of impact were known. Outlier tests are not performed for Parameters that do not have any measured values greater than its MRL.

Test results identified the following outliers: Barium detected at MW-8, lithium, sulfate, and zinc detected at MW-2 during the July 2016 monitoring event are outliers relative to all these parameters' values collected over the eight sampling events from all wells. The outliers are included in the Interwell statistics.

4.1.2 Adjustment for Non-Detects (NDs)

NDs (commonly described as "non-detects") represent analytical results reported as below their Method Reporting Limits (bMRL) and are adjusted based on the percentage of bMRL values. When less than 15 percent of values for a Parameter are NDs, those values are replaced with a value equal to half of the MRL. When 15 percent to 50 percent of values are reported below the MRL, the Aitcheson Adjustment is used for the ND data. The values for the NDs are set equal to their respective MRLs when more than 50 percent of values for a Parameter are below its MRL, and a non-parametric method is used.

4.1.3 Distribution Assessment

Data are evaluated to determine whether the distribution of each Parameter satisfies normality assumptions for further statistical analysis when less than 50 percent of the data for the Parameter are bMRL (<50% ND). Normality is evaluated using the Shapiro-Wilks test, which applies to cases where there are fewer than 50 samples. Distributions are first evaluated using non-transformed data and then, if the distribution does not satisfy normality constraints, it is tested again using natural log (ln) transformed data.

4.1.4 Trend Analysis

The background well concentration data are evaluated to determine if seasonal trends exist if there are any detected results. Trends are evaluated using the Mann-Kendall test (a non-parametric test for trend).

4.1.5 Predictive Limits Determination

Data are evaluated to determine whether a Parametric Prediction Limit (PPL) or a Non-parametric Prediction Limit (NPPL) can be used to estimate prediction limits for each Parameter at the background well. This evaluation depends on the percentage of measurements below their MRL and whether a distribution satisfies normality assumptions. For Parameters with less than 50 percent of measurements reported as below their MRL and a distribution that satisfies normality assumptions, a PPL is calculated. For Parameters with more than 50 percent of measurements reported as below their MRL or having a distribution that does not satisfy normality constraints, a NPPL is calculated.

The background well calculated PLs are tabulated and compared to 2L Standards or EPA Maximum Concentration Limit (MCL) in Table 1 in **Appendix D**.

4.1.6 Interwell Comparison

Parameter concentrations from compliance wells are compared to corresponding Prediction Limits (PLs) from the background well. Concentrations measured during the most recent sampling event represent the compliance well condition in the Interwell comparison. As previously described in the report "Prediction Limit for Background Well Parameters", the entire record of measurements from the background well is evaluated to determine whether a Parametric Prediction Limit (PPL) or a Non-parametric Prediction Limit (NPPL) can be used to estimate background well PLs. This evaluation depends on the percentage of measurements bMRL and whether a distribution satisfies normality assumptions. For parameters with less than 50 percent of measurements from all wells reported as bMRL and a distribution that satisfies normality assumptions from the background well, a PPL is calculated. For Parameters with more than 50 percent of measurements reported as bMRL or having a distribution that does not satisfy normality assumptions, a NPPL is calculated.

The detected parameters above the MRL But from each compliance well during the July 2016 sampling event is compared to the background well Parametric or non-parametric Prediction Limit. Parameters are considered to be within compliance limits if the July 2016 sampled concentration from the compliance well is less than the background well PL. Otherwise, compliance well values are evaluated to determine the nature of any increases and trends over time.

4.2 Statistical Analysis & Results

The ChemStat® statistical analysis identified the parameters with a statistically significant increase (SSI) over the background levels for the down-gradient wells. The results are summarized in Table 1 and Table 2 of **Appendix D**.

4.2.1 Predictive Limits Results

PL calculations and proposed site standards for the Site are presented in Table 1 (**Appendix D**) and summarized as follows:

- The following Parameters had more than 50 percent of measurements reported as being below their MRL: antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. For these parameters, the background well PL was calculated using Non-Parametric Prediction Limit (equal to maximum MRL or Maximum background concentration, whichever is larger); but for vanadium and zinc, the Chebyshev Inequality UPL Method was used (Table 1).
- The following Parameters had less than 50 percent of measurements reported as being below their MRL, with distributions that satisfy normality assumptions: barium, boron, calcium, chloride, lithium, radium-226, radium-228, sulfate, and TDS. For these Parameters, the background well upper PL was calculated using equation 18.3 of the Unified Guidance (95% Upper Prediction Limit).
- Fluoride had less than 50 percent of measurements reported as being below its MRL, with distributions that met normality assumptions when measurements were natural log-

transformed. The parametric prediction limit was calculated using equation 18.5 of the Unified Guidance (95% Upper Prediction Limit).

- The PL for field measured pH was calculated as a 95% (2 sided) parametric prediction interval.
- The calculated PL for antinomy, arsenic, cobalt, thallium, TDS, and vanadium from the background well were higher than their respective 2L, MCL, or groundwater protection limits. However, the PL for antinomy, arsenic, cobalt equal to the MRLs for these parameters and there was only one detection from 8 monitoring events at levels below their respective MRLs.

4.2.2 Interwell Comparison Results

Based on the results from the Prediction Limits for Background Well Parameters, the parameters Ba, B, Ca, Cl, F, Li, Ra-226, Ra-228, SO4, and TDS from the background wells follow normal distributions. Parametric 95 percent prediction limits were estimated for these parameters. Compliance observations for these parameters from the July 2016 sampling event were compared to their respective prediction limits. A one-sided (upper) parametric prediction limit (UPLs) was used to estimate limits for all parameters with the exception that a two-sided parametric prediction limit was chosen for pH (field) in accordance with the Unified Guidance direction for prediction limits for these parameters.

For parameters with detections fewer than twice during the 8 sampling events from the background well (including Tl, Cr, and Mo), non-parametric methods were used to estimate their respective prediction limits, where either the larger of the MRL or the detected result from the background well is used as the UPL. The UPLs for Vanadium and Zn were calculated using 95% Chebyshev UPL method in which these two parameters were detected more than twice from the background well during the 8 sampling events.

All the results are shown in the summary table (Table 2 in **Appendix D**). The results are summarized as follows:

<u>Parameters with Statistically Significant Increase above Background PL (SSI)</u>

- **Antimony**: Antimony observations from MW-1 to MW-3, and MW-8 show statistical significance compared to the background well NPPL. But the results show no trend over time at MW-2, MW-3 and MW-8 using Sen's slope estimator tests. Sen's slope estimator test was not conducted for MW-1 because only a single detection was found above the MRL during the 8 monitoring events.

- **Barium:** Barium observations from MW-3 and MW-8 have statistically significant increases (SSIs) above the background 95% UPL. But barium results show no trend over time for these wells using Sen's slope estimator tests.

- **Boron**: Boron observations from MW-2, MW-3, and MW-7 have SSIs compared to the background 95% UPL. But the results show no trend or downward trend over time using Sen's slope estimator tests.

- **Calcium**: Calcium observations from MW-1 to MW-4 and from MW-7 to MW-8 have SSIs compared to the background 95% UPL. But the results show no trend or downward trend over time except at MW-7, which showed an upward trend using Sen's slope estimator tests.

- **Chloride**: Chloride observations from MW-1 to MW-4, MW-7, and MW-8 have SSIs compared to the background 95% UPL. But the results show no trend or downward trend over time using Sen's slope estimator tests.

- **Chromium**: Chromium detected at MW-2 has an SSI compared to the background NPPL; but there is no trend in the chromium results over time at this well using Sen's slope estimator test.

- **Fluoride**: Fluoride observations from MW-4 to MW-6 have SSIs compared to the background 95% UPL. But the fluoride results showed no trend or downward trend over time for these wells using Sen's slope estimator tests.

- **Lithium**: Lithium observations from MW-2 and MW-3 have SSIs compared to the background 95% UPL. The results at MW-2 showed an upward trend, but there is no trend at MW-3 over time using Sen's slope estimator tests.

- **Molybdenum**: Molybdenum observations detected at MW-2 and MW-3 show SSIs above the background NPPL.

- **pH (field)**: The pH (field) observations from MW-2 and MW-3 have SSIs outside the background 95% Prediction Interval Limit. But the pH (field) results do not show a trend over time for both wells using Sen's slope estimator tests.

- **Sulfate**: Sulfate observations from MW-2, MW-3, and MW-6 have SSIs over the background 95% UPL. But the results showed no trend over time for these wells using Sen's slope estimator tests.

- **Total Dissolved Solids (TDS)**: TDS observations from MW-1, MW-2, MW-3, MW-4, MW-7, and MW-8 have SSIs from the background 95% UPL. But the results show no trend over time for all wells except at MW-2 where TDS shows an upward trend using Sen's slope estimator tests.

- **Zinc**: Zinc observations detected from MW-1, MW-2, MW-5, MW-6, and MW-8 have SSIs above the background well 95% Chebyshev UPL, but Sen's slope estimator test did not show any increasing trend for zinc from all these wells.

<u>99 Percent LCL (99%LCL) Compared to UPL of Background Well, 2L Standard, MCL or GWPS</u>

The calculated 99%LCL from the downgradient wells for the parameters has SSI is compared to the higher value of the groundwater standards (including 2L, MCL, GWPS, or UPL of background well). The 99%LCL for calcium and molybdenum are not used to compare with their respective background well PLs because standards for these parameters have not been

established by EPA or the state. Therefore it is unknown whether the standards are required for these parameters. The 99% LCL above the standard are noted and listed below.

- **Antimony**: The 99%LCL for antimony from MW-8 is above the 2L standard (1 µg/L); but the results do not show any increasing trend based on time series plots and Sen's Slope estimator tests.
- **Barium:** The 99%LCL for barium from MW-8 is above the 2L standard (700 µg/L); but the results do not show any increasing trend based on time series plots and Sen's Slope estimator tests.
- **Chloride**: The 99%LCLs for chloride from MW-2, MW-3, and MW-8 are above the UPL of the background well (345.2 mg/L); but these results do not show any increasing trend based on time series plots and Sen's Slope estimator tests.
- **TDS**: The 99%LCLs for TDS from MW-2, MW-3, MW-7, and MW-8 are above the 95% UPPL of the background well; but these results do not show any increasing trend except at MW-2 based on the time series plots and Sen's Slope estimator tests.

The remaining monitored parameters either are not detected, not above the MRL or are not statistically significant above the background concentration levels.

5 Conclusions

Rounds 7 and 8 of the required eight monitoring events were conducted at Brickhaven No. 2 Mine Tract "A" Structural Fill site from May to July 2016. In conjunction with the 3rd monitoring event discussed in the *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2015) and 4th through 6th monitoring events discussed in the *2016 First Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report* (HDR, 2016a), these events represent post-CCP placement conditions at the site. The first and second monitoring events were conducted prior to the placement of CCP on October 23, 2015, and therefore represent pre-existing site conditions; these results were also previously discussed in detail in the 2015 Semi-annual report (HDR, 2015). The requisite one minimum independent background monitoring event specified in Permit No. 1910-STRUC-2015 have thus been met. No further background monitoring events will occur as a total of six post-CCP placement events and two pre-CCP placement events are now completed.

A summary of the findings from the 7th and 8th monitoring events is provided below and in **Table 6-1** and **Table 6-2**:

- Groundwater was encountered at the site from approximately six feet below top of casing to approximately 60 feet below top of casing.
- Groundwater samples collected at monitoring wells BG-1, MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, and MW-8 indicated the presence of constituents above established NCGPS.

- Groundwater in the vicinity of the CCR structural fill generally flows from the central portion of the Site to the west and east toward Shaddox Creek and Gulf Creek, respectively.
- Chloride exceeded its NCGPS in several separate wells during the 7th and 8th Rounds. Exceedances of chloride were similarly detected in the background monitoring events (i.e. 1st and 2nd Rounds) and during the post-CCP placement monitoring event (i.e. Round 3 to present). Chloride is likely naturally occurring due to site geological conditions. MW-5 has not exceeded its NCGPS during any monitoring event.
- TDS consistently exceeded its NCGPS in eight of nine wells, including background well BG-1, during the 7th and 8th Rounds. MW-5 has not exceeded its NCGPS for TDS during any monitoring event. Elevated TDS concentrations remain and are likely naturally occurring throughout the site.
- Groundwater pH was in exceedance in MW-4 for all 4th through 8th monitoring events and was in exceedance in MW-6 for Round 8. Low pH previously observed at BG-1 has continued to stabilize above the NCGPS threshold during the 7th and 8th monitoring events. Intermittently low pH is likely naturally occurring at the site, with several field pH values only slightly above the 6.5 SU threshold for multiple monitoring events; occasional fluctuations around this NCGPS threshold will likely continue.
- Antimony exhibited multiple intermittent exceedances in different wells during the 7th and 8th Rounds, at MW-1, MW-2, MW-3, and MW-8. These detection patterns and concentration levels are similar to pre-CCP placement and are likely naturally occurring.
- Barium and vanadium exhibited multiple exceedances in different wells during the two monitoring events. These constituents are likely naturally occurring.
- Analytical data from the 7th and 8th monitoring events indicate placement of CCP has not impacted groundwater at the site.
- Surface water collected at two off-site locations exhibited exceedances of pH and copper during the 7th Rounds and cobalt during the 8th Round. Analytical data from the 7th and 8th monitoring events indicate surface water has not been impacted by the placement of CCP at the site.
- Leachate samples generally exhibited an increase in exceedance frequency and parameter concentrations relative to the first leachate sample collected in Round 3. NCGPS exceedances during the 4th through 6th Rounds included antimony, boron, selenium, sulfate, TDS, and vanadium.
- Antimony, barium, chloride, pH, TDS, and vanadium were evaluated to be naturally occurring constituents in site background groundwater and pre-CCP Placement events. Further sampling and analysis are necessary to refine naturally occurring conditions, as may be required.
- Analytical data from the 3rd through 8th monitoring events indicate placement of CCP has not impacted groundwater at the site.

A summary of the statistical analysis is provided below and in **Appendix D**:

- The following Parameters had more than 50 percent of measurements reported as being below their MRL: antimony, arsenic, beryllium, cadmium, chromium, cobalt,

copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. While barium, boron, calcium, chloride, fluoride, lithium, radium-226, radium-228, sulfate, and TDS had less than 50 percent of measurements reported as being below their MRL, with distributions that satisfy normality assumptions.

- The calculated PL for antinomy, arsenic, cobalt, thallium, TDS, and vanadium from the background well were higher than their respective 2L, MCL, or groundwater protection limits.
- Based on the results from the Prediction Limits for Background Well Parameters, the parameters Ba, B, Ca, Cl, F, Li, Ra-226, Ra-228, SO4, and TDS from the background wells follow normal distributions.
- Numerous parameters including antimony, barium, boron, calcium, chloride, chromium, fluoride, molybdenum, pH, sulfate, and zinc show statistical significance compared to the background well NPPL, 95% UPL, or 99% UCL. But the results show no trend and/or downward trend over time at a number of the wells using Sen's slope estimator tests.
- Lithium observations from MW-2 and MW-3 have SSIs compared to the background 95% UPL. The results at MW-2 showed an upward trend, but there is no trend at MW-3 over time using Sen's slope estimator tests.
- TDS observations from MW-1, MW-2, MW-3, MW-4, MW-7, and MW-8 have SSIs from the background 95% UPL. But the results show no trend over time for all wells except at MW-2 where TDS shows an upward trend using Sen's slope estimator tests. The 99%LCLs for TDS from MW-2, MW-3, MW-7, and MW-8 are above the 95% UPPL of the background well; but these results do not show any increasing trend except at MW-2 based on the time series plots and Sen's Slope estimator tests.
- Subsequent groundwater sampling and refinement of the background statistical analysis will continue to be monitored and evaluated to determine if modifications to detection monitoring is required.

6 Recommendations

Based on the findings of this assessment, HDR makes the following recommendations:

- Groundwater, surface water and leachate sampling is recommended to be conducted on a semi-annual basis commencing 180 days from the acceptance of this report.
- Continued discussion with NCDEQ related to ongoing detection monitoring and further refinement of the background statistical analysis.
- Further evaluation of naturally occurring constituents at the Site.

7 References

Buxton Environmental. 2015a. *Water Quality Monitoring Plan for Brickhaven No.2 Mine Tract "A" Structural Fill.*

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HDR. 2014. *Permit Application for Brickhaven No.2 Mine Tract "A" Structural Fill including Design Hydrogeological Report.*

HDR. 2015. *2015 Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report. December 2015.*

HDR. 2016a. *2016 First Semi-Annual Groundwater, Surface Water, and Leachate Sampling Report. May 2016.*

North Carolina Department of Natural Resources and Community Development. 1985. *North Carolina Geologic Map.*

North Carolina General Assembly. *Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729).* Ratified.

NCDEQ. 2008. *Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling.*

Singhal, B. B.S. and R. P. Gupta. 2010. *Applied Hydrogeology of Fractured Rocks: Springer, 2nd Edition*, 408p. (Table 8-1, p. 140)

United States Geological Survey. 2004. *Arsenic, Nitrate, and Chloride in Groundwater, Oakland County, Michigan.*

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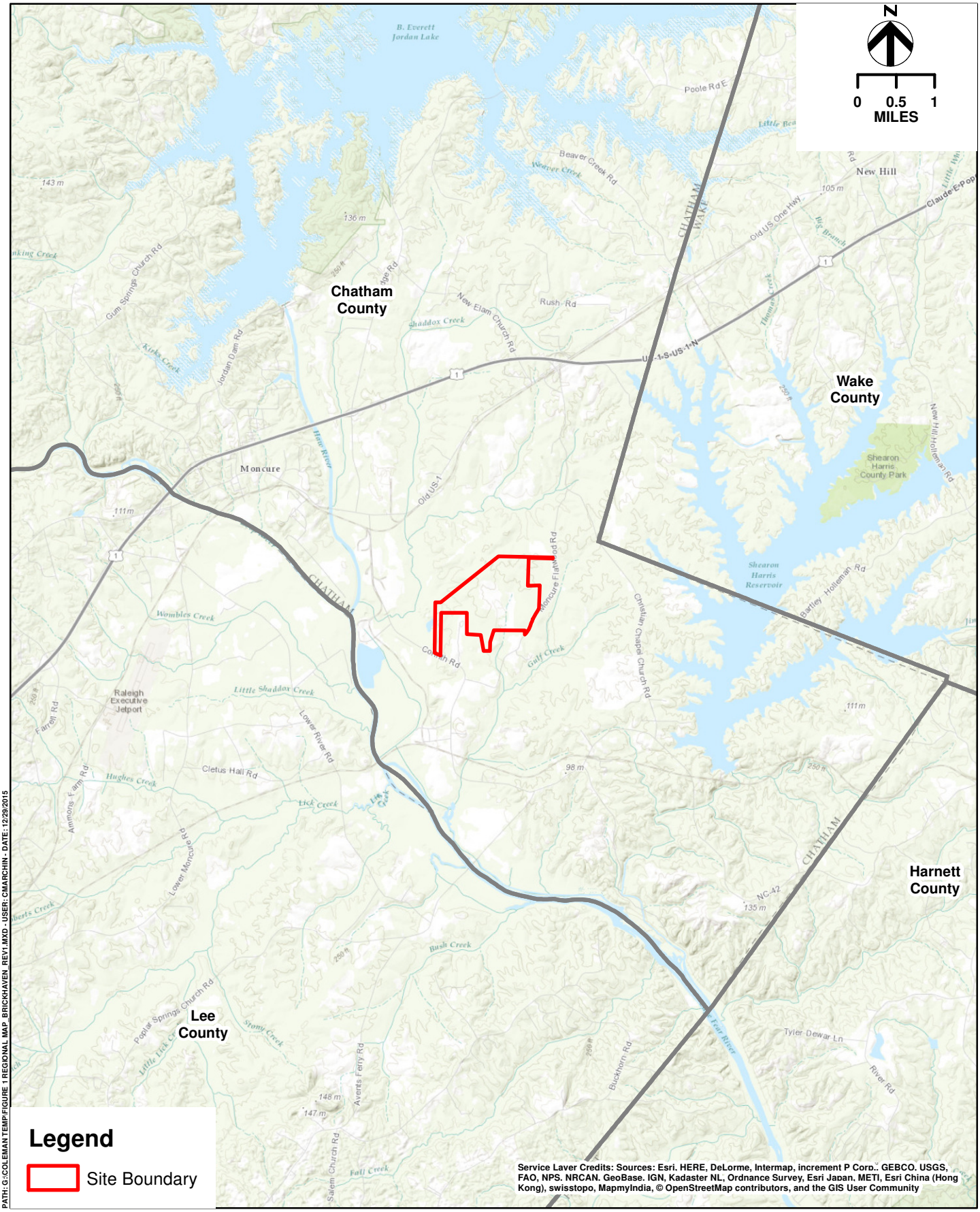
Figures

Figure 1: Regional Site Location Map
Figure 2: Regional USGS Topographic Map
Figure 3: Site Layout Map with Monitoring Wells Locations
Figure 4: Surface Water Sample Location Map
Figure 5: Leachate Sample Collection Location
Figure 6: Potentiometric Surface Map



PATH: G:\COLEMAN TEMP\FIGURE 1 REGIONAL MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 12/29/2015

REGIONAL SITE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

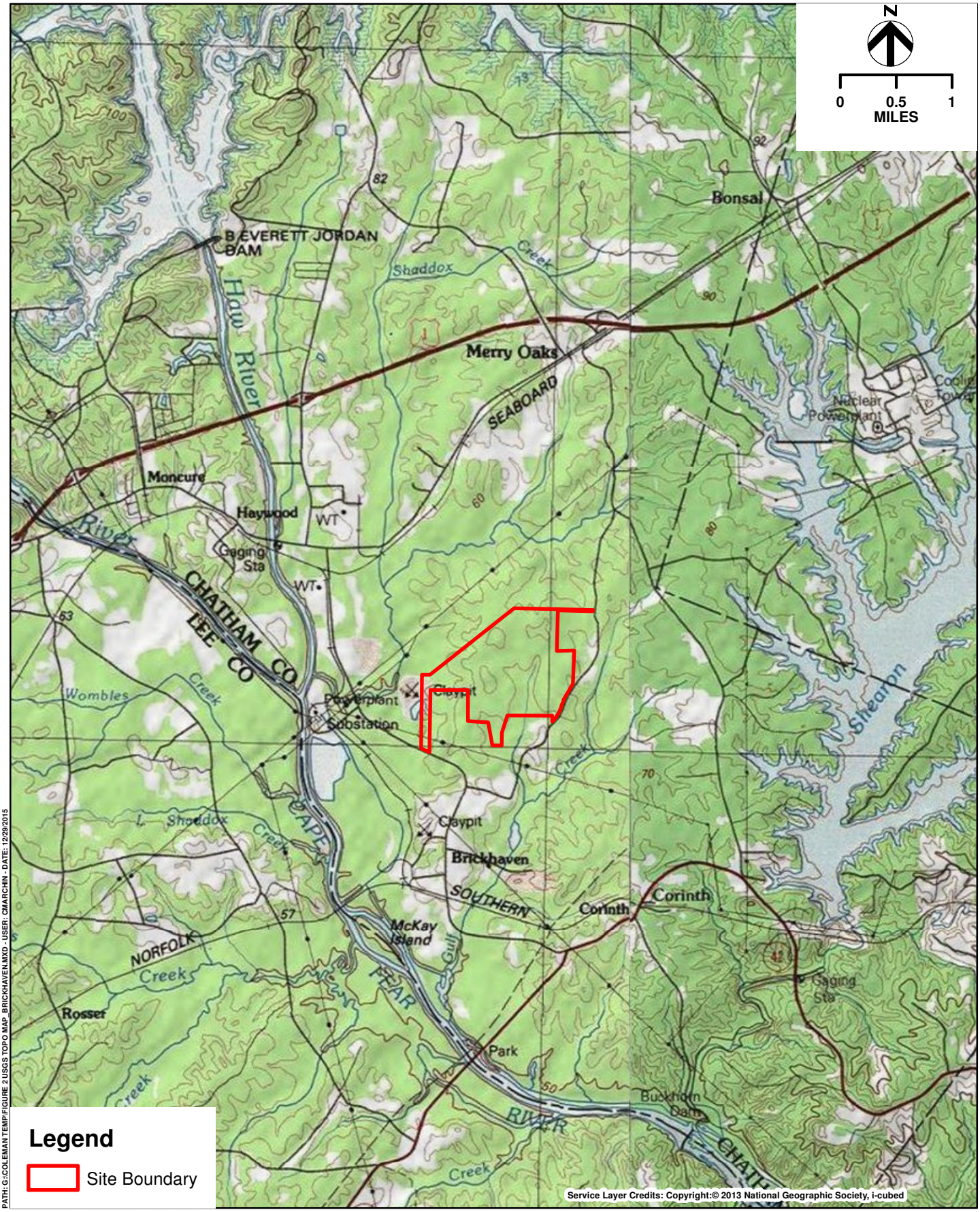
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

September 2016

FIGURE

1



PATH: G:\COLEMAN TEMP\FIGURE 2 USGS TOPO MAP_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 12/29/2015

REGIONAL USGS TOPOGRAPHIC MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

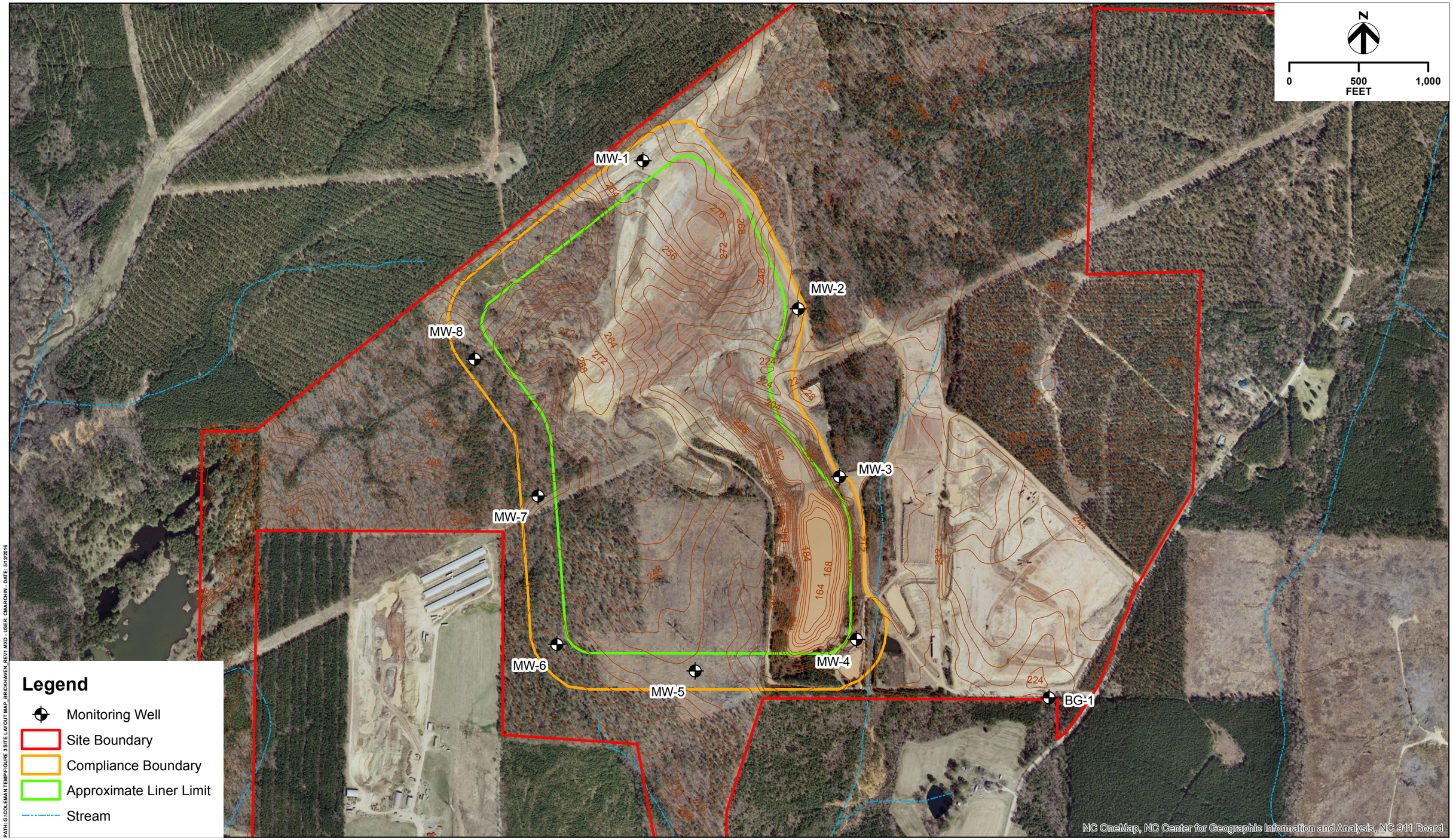
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

September 2016

FIGURE

2



PATH: G:\COLEMAN TEMP\FIGURE 3 SITE LAYOUT MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 6/12/2016

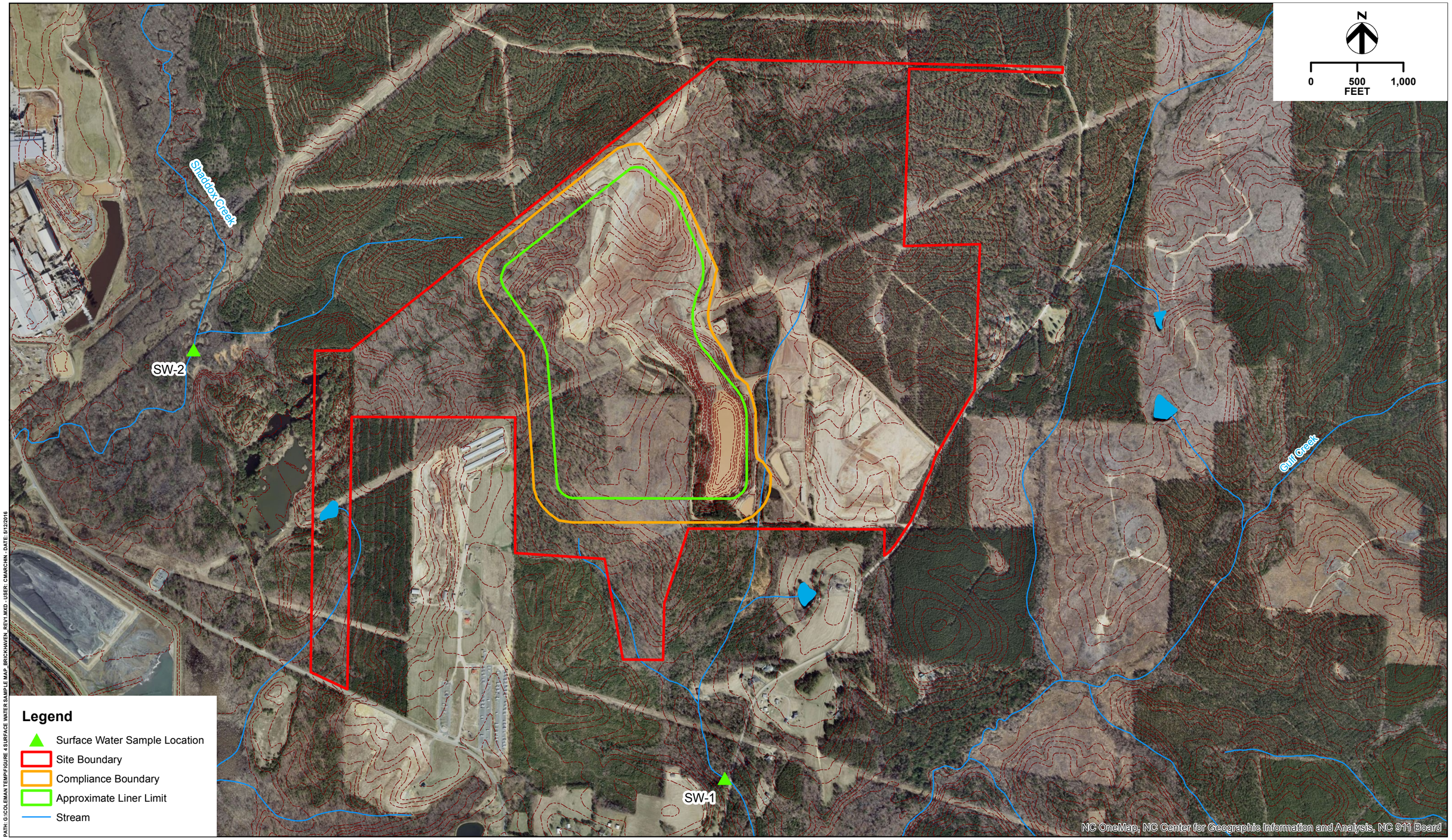
HDR

SITE LAYOUT MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
September 2016

FIGURE
3



PATH: G:\COLEMAN TEMP\FIGURE 4 SURFACE WATER SAMPLE MAP_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 6/12/2016

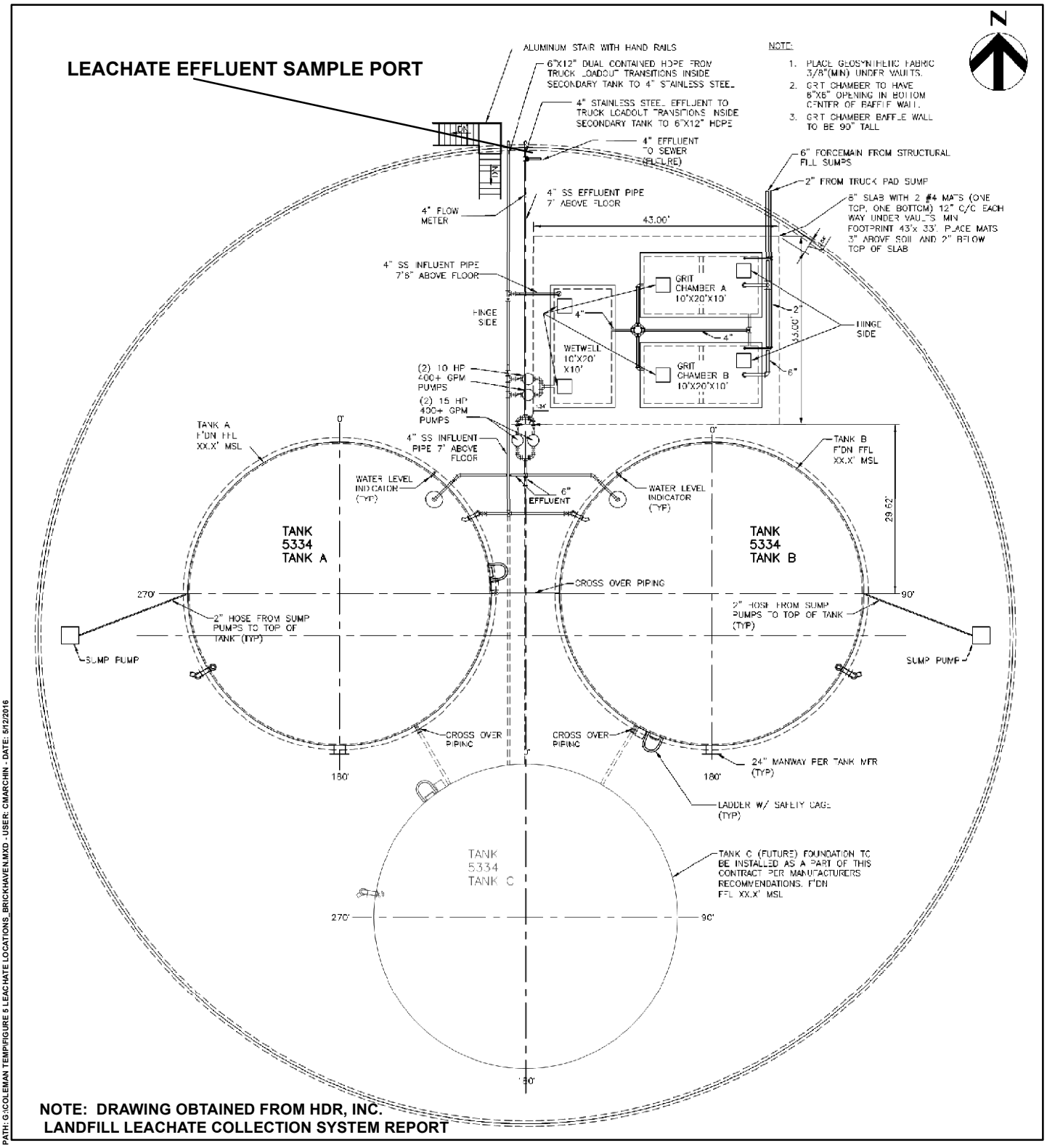
HDR

SURFACE WATER SAMPLE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
September 2016

FIGURE
4



NOTE: DRAWING OBTAINED FROM HDR, INC.
LANDFILL LEACHATE COLLECTION SYSTEM REPORT

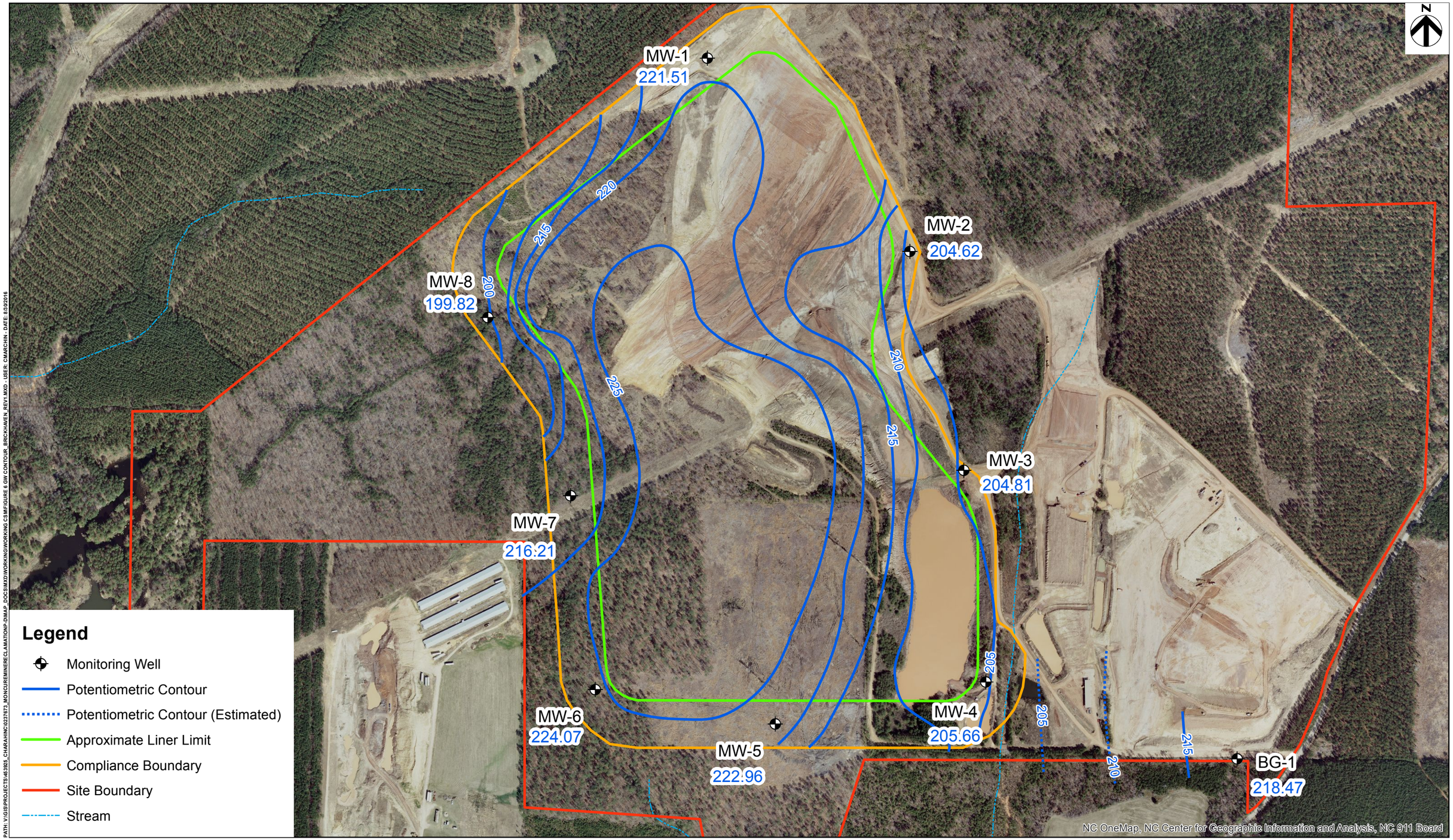
PATH: G:\COLEMAN TEMP\FIGURE 5 LEACHATE LOCATIONS_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 5/12/2016

LEACHATE SAMPLE COLLECTION LOCATION
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
September 2016

FIGURE
5



Note:
1. Groundwater data was collected by Buxton Environmental, Inc. on July 11, 2016.

0 190 380 760 1,140 1,520 Feet

WATER TABLE SURFACE MAP - JULY 2016
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
September 2016

FIGURE
6

PATH: V:\GIS\PROJECTS\46\925_CHARAHINC\0237673_MONCUREMINERECLAMATION\P-DIMAP_DOCS\MXD\WORKING\WORKING CS\MF\FIGURE 6 GW CONTOUR_BRICKHAVEN_REV1.MXD - USER: CMARCHIN - DATE: 8/3/2016

Tables

Table 1: Well Construction and Survey Summary
Table 2: Groundwater Elevations for July 11, 2016
Table 3: Hydraulic Conductivity
Table 4: Horizontal Hydraulic Gradients
Table 5: Groundwater Flow Velocities
Table 6s: Analyte Detections and Exceedances

Table 1: Well Construction and Survey Summary

Well ID	Northing	Easting	Pad Elev. (msl)	TOC Elev. (msl)	TD BGS (ft)	TD BTOC (ft)	Screen Length (ft)	Screen Interval (msl)	Lithologic Unit
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	Layered Rock/PWR*
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	Layered Rock/PWR*
MW-2	673677.07	1994537.54	227.45	229.97	45.00	47.52	15	197.45 - 182.45	Layered Rock/PWR*
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	PWR
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	Residuum/PWR
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	PWR
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	216.63 - 201.63	Residuum/PWR
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	Residuum/PWR
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	PWR

Notes:

1. Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.
2. Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.
3. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.

* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation

Brickhaven Background Sampling Report

Table 2: Groundwater Elevations

July 11, 2016

Well ID	Screen Interval Elevation (msl)	DTW BTOC (ft)	TOC Elev. (msl)	DTW Elevation (msl)	Lithologic Unit
BG-1	200.14 - 185.14	9.45	228.19	218.74	Layered Rock/PWR*
MW-1	220.20 - 205.20	58.57	280.08	221.51	Layered Rock/PWR*
MW-2	197.45 - 182.45	25.35	229.97	204.62	Layered Rock/PWR*
MW-3	194.20 - 179.20	17.75	222.56	204.81	PWR
MW-4	201.79 - 191.79	11.47	217.13	205.66	Residuum/PWR
MW-5	208.72 - 198.72	21.90	244.86	222.96	PWR
MW-6	216.63 - 201.63	7.03	231.10	224.07	Residuum/PWR
MW-7	224.53 - 214.53	15.50	231.71	216.21	Residuum/PWR
MW-8	202.41 - 187.41	36.65	236.47	199.82	PWR

Notes:

1. Depth to water measurements obtained on April 5, 2016 to the nearest 0.01 foot with a depth-to-water meter by Buxton Environmental, Inc.
2. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.

* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation

Table 3: Hydraulic Conductivity
Slug Testing - September 2015

Well ID	DTW BTOC (ft)	Length of Water Column (ft)	Screen Length (ft)	Screen Interval (msl)	Hydraulic Conductivity (k, cm/sec)	Lithologic Unit
BG-1	9.45	30.59	15	200.14 - 185.14	7.76E-05	Layered Rock/PWR*
MW-1	58.57	15.33	15	220.20 - 205.20	4.11E-04	Layered Rock/PWR*
MW-2	25.35	6.54	15	197.45 - 182.45	3.41E-06	Layered Rock/PWR*
MW-3	17.75	27.81	15	194.20 - 179.20	4.08E-07	PWR
MW-4	11.47	14.04	10	201.79 - 191.79	1.41E-04	Residuum/PWR
MW-5	21.90	32.37	10	208.72 - 198.72	8.01E-06	PWR
MW-6	7.03	21.22	15	216.63 - 201.63	1.10E-04	Residuum/PWR
MW-7	15.50	8.07	10	224.53 - 214.53	1.26E-06	Residuum/PWR
MW-8	36.65	12.66	15	202.41 - 187.41	1.29E-04	PWR

Notes:

1. Depth to water measurements obtained on September, 2015 to the nearest 0.01 foot with a depth-to-water meter by Buxton Environmental, Inc. prior to slug testing.
2. TD=total depth; BGS=below ground surface;TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing, msl = above mean sea level, ft.
3. Hydraulic conductivity values determined by Buxton Environmental, Inc. on September 10, 2015 by conducting rising head slug tests; and solved utilizing the Bouwer-Rice (unconfined slug test) solution with AQTESOLV for Windows Version 4.50 software by Hydrosolv, Inc. (1996-2007).

* = interpreted lithologic unit based on relative drilling hardness during well installation

Table 4: Horizontal Hydraulic Gradients

Horizontal Hydraulic Gradient (*i* , dh/dl)									
	BG-1	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**
BG-1	-	0.0010				0.002	0.001		
MW-1		-					0.001		
MW-2	0.004	0.01	-	0.00	0.000	0.01	0.01	0.01	
MW-3	0.006	0.006		-		0.01	0.008	0.005	
MW-4	0.009	0.004		-0.001	-	0.01	0.008	0.00	
MW-5		-0.0004				-	0.001		
MW-6							-		
MW-7	0.001	0.002				0.004	0.007	-	
MW-8	0.004	0.01	0.002	0.002	0.002	0.01	0.01	0.02	-

1. Positive horizontal hydraulic gradients calculated by dividing the difference in hydraulic head between a well pair by the lenth of the flow path between the well pair. (*i* = dh/dl)
2. All well pairs assumed to be screened in same surficial aquifer unit
3. Horizontal flow path distance calculated by $\sqrt{(Easting_1 - Easting_2)^2 + (Northing_1 - Northing_2)^2}$
4. Top-of-casing and ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) determined by Lawrence Surveying of Monroe, NC.
5. Top-of-casing and ground surface elevations and horizontal locations at BG-1, MW-1, MW-2, MW-3, MW-6 and MW-8 determined by McAdams of Durham, NC.
6. Static water level elevations from July 11, 2016 monitoring event. See **Table 2**.

Table 5: Groundwater Flow Velocities

Groundwater Flow Velocity Between Well Pairs (V_s, ft/year)									
	BG-1	**MW-1**	**MW-2**	**MW-3**	**MW-4**	**MW-5**	**MW-6**	**MW-7**	**MW-8**
BG-1	-	1.4				0.6	1.3		
MW-1		-					1.4		
MW-2	1.2	6.8	-	0.0	0.1	0.6	1.3	0.1	
MW-3	0.6	1.3		-		0.3	0.6	0.0	
MW-4	9.2	9.8		-0.1	-	4.6	7.5	0.4	
MW-5		-0.3				-	0.3		
MW-6							-		
MW-7	0.1	0.4				0.1	0.61	-	
MW-8	5.5	36.6	0.7	0.2	2.2	3.8	12.5	1.8	-

1. Flow velocities between well pairs estimated by $V_S = \frac{Ki}{P_e}$

   Where: V_s = groundwater flow velocity

   K = horizontal hydraulic conductivity (See **Table 3**)

   i = horizontal hydraulic gradient (See **Table 4**)

   P_e = average effective porosity between given well pairs

2. Effective porosity values from geotechnical testing and the literature (McWhorter and Sunada, 1977; Sinhal and Gupta, 2010) where geotechnical data was not available.

Brickhaven Background Sampling Report

Table 6-1: Analytical Detections and Exceedances
Seventh Round Results
May 2016

		Groundwater Analysis											Quality Control			Surface Water Analysis			Leachate Analysis	
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Amb. Blank	Duplicate (MW-1)	SW-1	SW-2	***NCSWWS***	Leachate-1	***NCGPS***
EPA APPENDIX III																				
Boron (µg/l)	7440-42-8	6.1	9.7	40.5	39	6.4	10.7	6.1	21.2	9.3	*700*	--	ND	ND	9.6	15	29.3	*NS*	593	*700*
Calcium (µg/l)	7440-70-2	29,500	87,800	130,000	161,000	18,600	11,900	33,200	51,200	144,000	*NS*	*NS*	ND	ND	93,400	5,220	10,900	*NS*	90,000	*NS*
Chloride (µg/l)	16887-00-6	250,000	**307,000**	**933,000**	**1,130,000**	144,000	19,300	243,000	**327,000**	**396,000**	*250,000*	--	ND	ND	**325,000**	16,700	14,900	*250,000*	5,200	*250,000*
Fluoride (µg/l)	16984-48-8	120	110	130	210	420	500	460	220	ND	*2,000*	--	ND	ND	110	120	120	*1,800*	140	*2,000*
pH* (standard units)	-	6.8	6.8	7.9	7.4	6.5	7.00	**6.4**	6.9	7.0	*6.5-8.5*	--	N/A	N/A	6.71	**5.8**	6.6	*6.0-9.0*	8.2	*6.5-8.5*
Sulfate (µg/l)	14808-79-8	19,300	10,900	163,000	16,800	3,400	3,400	51,600.0	19,100.0	6,000	*250,000*	--	ND	ND	10,200	10,600	15,000	*250,000*	178,000	*250,000*
Total Dissolved Solids (µg/l)	-	**633,000**	**920,000**	**2,870,000**	**3,180,000**	486,000	229,000	**659,000**	**956,000**	**1,530,000**	*500,000*	--	ND	ND	**1,090,000**	386,000	174,000	*500,000*	427,000	*500,000*
EPA APPENDIX IV																				
Antimony (µg/l)	7440-36-0	ND	ND	**8.9**	**10.7**	ND	ND	ND	ND	**7.5**	*1*	--	ND	ND	ND	ND	ND	*5.6*	**6.9**	*1*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*	ND	*10*
Barium (ug/l)	7440-39-3	330	121	197	**728**	90.5	100	88.3	222	**1,260**	*700*	--	ND	ND	134	177	81.1	*1,000*	95.6	*700*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	ND	ND	*6.5*	ND	*4*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	7.8	ND	*50*	ND	*10*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*3*	ND	*1*
Fluoride (µg/l)	16984-48-8	120	110	130	210	420	500	460	220	ND	*2,000*	--	ND	ND	110	120	120	*1,800*	ND	*2,000*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	--	ND	ND	ND	13.2	ND	*25*	ND	*15*
Lithium (µg/l)	7439-93-2	24	27.5	350	102	15.8	8.9	30.6	21.5	29.7	*NS*	*NS*	ND	ND	28.6	6.8	3.40	*NS*	30.1	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*	ND	*1*
Molybdenum (µg/l)	7439-98-7	ND	ND	10.1	10.2	ND	ND	ND	ND	ND	*NS*	*NS*	ND	ND	ND	ND	ND	*160*	99.5	*NS*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*	**43.8**	*20*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	--	ND	ND	ND	ND	ND	*0.24*	ND	*0.28*
Radium 226 (pCi/l)	13982-63-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*	*5 (combined)*	ND	ND	ND	ND	ND	*NS*	ND	*NS*
Radium 228 (pCi/l)	15262-20-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*		ND	ND	ND	ND	ND	*NS*	ND	*NS*
EPA APPENDIX I METALS																				
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	**7.9**	ND	*7*	ND	*1,000*
Nickel (µg/l)	7440-02-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*100*	--	ND	ND	ND	5.20	ND	*88*	ND	*100*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0.06*	ND	*20*
Vanadium (µg/l)	7440-62-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.3*	--	ND	ND	ND	25.1	11.00	*NS*	**17.8**	*0.3*
Zinc (µg/l)	7440-66-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	25.8	16.6	*50*	10.3	*1,000*
EPA APPENDIX I VOC'S																				
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*	ND	*6,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*	ND	*0.6*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*	ND	*4*
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*5.6*	ND	*70*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*	ND	*0.4*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*	ND	*700*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*	ND	*70*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*	ND	*6*

Notes:

1. Groundwater, surface water, and leachate samples collected during May 2016 and analyzed for above parameters by Pace Analytical Laboratories
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and **shade** denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. pH was field tested by Pace Analytical Laboratories

Brickhaven Background Sampling Report

Table 6-2: Analytical Detections and Exceedances
Eigth Round Results
July 2016

		Groundwater Analysis											Quality Control			Surface Water Analysis			Leachate Analysis	
Analyte	**CAS Number**	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	***NCGPS***	***Federal MCL***	Equip. Blank	Amb. Blank	Dup. (MW-1)	SW-1	SW-2	***NCSWWS***	Leachate-1	***NCGPS***
EPA APPENDIX III																				
Boron (µg/l)	7440-42-8	7.0	7.9	39.4	41.9	5.8	9.8	7.7	22.7	9.6	*700*	--	19	19	7.5	17.4	36.2	*NS*	**1150**	*700*
Calcium (µg/l)	7440-70-2	31,600	127,000	159,000	182,000	53,500	9,990	35,400	53,200	125,000	*NS*	*NS*	ND	ND	122,000	2,760	16,800	*NS*	156,000	*NS*
Chloride (µg/l)	16887-00-6	**292,000**	**547,000**	**1,160,000**	**1,190,000**	**423,000**	17,600	239,000	**382,000**	**504,000**	*250,000*	--	ND	ND	**573,000**	16,100	7,000	*250,000*	6,000	*250,000*
Fluoride (µg/l)	16984-48-8	110	120	140	260	340	500	310	210	ND	*2,000*	--	ND	ND	120	ND	ND	*1,800*	150	*2,000*
pH* (standard units)	-	6.50	6.50	8.50	7.30	**6.30**	6.80	**6.40**	6.90	6.90	*6.5-8.5*	--	N/A	N/A	6.84	6.70	6.40	*6.0-9.0*	7.6	*6.5-8.5*
Sulfate (µg/l)	14808-79-8	18,200	9,400	205,000	125,000	9,200	2,600	53,800	11,200	5,900	*250,000*	--	ND	ND	9,600	12,200	8,800	*250,000*	**276,000**	*250,000*
Total Dissolved Solids (µg/l)	-	**668,000**	**1,410,000**	**3,290,000**	**2,440,000**	**1,040,000**	221,000	**660,000**	**1,100,000**	**1,340,000**	*500,000*	--	72,000	93,000	**1,590,000**	81,000	167,000	*500,000*	**711,000**	*500,000*
EPA APPENDIX IV																				
Antimony (µg/l)	7440-36-0	ND	**6.1**	**12.3**	**11.4**	ND	ND	ND	ND	**7.2**	*1*	--	ND	ND	**7.3**	ND	ND	*5.6*	**5.7**	*1*
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*10*	**16.0**	*10*
Barium (ug/l)	7440-39-3	363	225	220	**728**	257	93	89.8	224	**1200**	*700*	--	ND	ND	229	72.9	170	*1,000*	144	*700*
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	--	ND	ND	ND	ND	ND	*6.5*	ND	*4*
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	--	ND	ND	ND	ND	ND	*2*	ND	*2*
Chromium (µg/l)	7440-47-3	ND	ND	5.2	ND	ND	ND	ND	ND	ND	*10*	--	ND	ND	ND	ND	ND	*50*	**66.4**	*10*
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	**19.1**	*3*	ND	*1*
Fluoride (µg/l)	16984-48-8	110	120	140	260	340	500	310	210	ND	*2,000*	--	ND	ND	120	ND	ND	*1,800*	150	*2,000*
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	--	ND	ND	ND	ND	ND	*25*	ND	*15*
Lithium (µg/l)	7439-93-2	23.8	32.8	356	73.2	24.7	9.3	31.7	23.0	31.2	*NS*	*NS*	ND	ND	32.9	1.4	ND	*NS*	61.8	*NS*
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	--	ND	ND	ND	ND	ND	*0.012*	ND	*1*
Molybdenum (µg/l)	7439-98-7	ND	ND	10.8	12.0	ND	ND	ND	ND	ND	*NS*	*NS*	ND	ND	ND	ND	ND	*160*	191	*NS*
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*5*	**27.2**	*20*
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	--	ND	ND	ND	ND	ND	*0.24*	ND	*0.28*
Radium 226 (pCi/l)	13982-63-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*	*5 (combined)*	ND	ND	ND	ND	ND	*NS*	ND	*NS*
Radium 228 (pCi/l)	15262-20-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*NS*		ND	ND	ND	ND	ND	*NS*	ND	*NS*
EPA APPENDIX I METALS																				
Copper (µg/l)	7440-50-8	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1,000*	--	ND	ND	ND	ND	ND	*7*	ND	*1,000*
Nickel (µg/l)	7440-02-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*100*	--	ND	ND	ND	ND	ND	*88*	ND	*100*
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	--	ND	ND	ND	ND	ND	*0*	ND	*20*
Vanadium (µg/l)	7440-62-2	**5.1**	ND	ND	ND	ND	ND	ND	ND	ND	*0.3*	--	ND	ND	ND	ND	ND	*NS*	**20.5**	*0.3*
Zinc (µg/l)	7440-66-6	ND	13.2	37.9	ND	ND	21.2	11.8	ND	17.8	*1,000*	--	ND	ND	12.0	ND	ND	*50*	ND	*1,000*
EPA APPENDIX I VOC'S																				
Acetone (µg/l)	67-64-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6,000*	--	ND	ND	ND	ND	ND	*2,000*	ND	*6,000*
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	*80 (all THM's)*	ND	ND	ND	ND	ND	*NS*	ND	*0.6*
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*		ND	ND	ND	ND	ND	*4.3*	ND	*4*
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*		ND	ND	ND	ND	ND	*5.6*	ND	*70*
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*		ND	ND	ND	ND	ND	*NS*	ND	*0.4*
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	--	ND	ND	ND	ND	ND	*NS*	ND	*700*
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	--	ND	ND	ND	ND	ND	*47*	ND	*70*
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*6*	--	ND	ND	ND	ND	ND	*63*	ND	*6*

Notes:

1. Groundwater, surface water, and leachate samples collected during July 2016 and analyzed for above parameters by Pace Analytical Laboratories
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOC's = volatile organic compounds
3. NCGPS = North Carolina Groundwater Protection Standard (J-flagged data not considered)
4. Federal MCL = Federal Maximum Contaminant Level in drinking water (Federal MCL provided when no established NCGPS; or for further clarification as with THM's)
5. NCSWWS = North Carolina Surface Water and Wetland Standards (15A NCAC 02B) for Gulf Creek (SW-1) and Shaddox Creek (SW-2) which are both Class WS-IV Waters or are National Criteria per EPA
6. THM's = trihalomethanes (bromodichloromethane, bromoform, chloroform and dibromochloromethane) (all generally associated with the breakdown of chlorinated muncipal water in contact with natural water)
7. **Bold** and **shade** denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
8. B = detected in method blank; J = estimated result <PQL (practical quantitation limit aka report limit (RL)) and >=MDL (method detection limit aka MDC)
9. Ambient blank samples obtained during each of three days of the 5th Round Monitoring Event. Ambient Blank/equipment blank from 02/17/16 presented above; two remaining ambient blank samples were non-detect for all parameters.
10. pH was field tested by Pace Analytical Laboratories

A

Appendix A – Sampling and Field Logs

Quarry, Sean

From: Colley Frank <Colley.Frank@pacelabs.com>
Sent: Wednesday, August 17, 2016 2:17 PM
To: Quarry, Sean
Subject: Fwd: Well Sweep Charrah - Brickhaven 05/25/16

I believe this is all I have for Round 7. If you need us to put in excel spreadsheet for you just let me know.

Colley Frank
Carolina's Field Services /

Fleet Manager
Charlotte Laboratory
Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Phone: 704.875.9092
Fax: 704.875.9091
Mobile: 704.589.3409

>>> Clint Sorrell <clint.sorrell@pacelabs.com> 5/25/2016 3:17 PM >>>

Well ID:	Static.	Total
BG-1.	9.38.	43.78
MW-1.	58.48	75.55
MW-2.	24.80.	48.13
MW-3.	10.35.	43.60
MW-4.	8.65.	25.74
MW-5.	22.18.	46.96
MW-6.	6.78.	27.93
MW-7.	15.65.	17.64
MW-8.	35.95	49.68

Clint Sorrell
Environmental Technician
Pace Analytical
6701 Conference Drive
Raleigh NC, 27607

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Charah – Brickhaven

Round 8

Well Sweep

Well ID:	Static Water Level (ft):	Total Depth (ft):
BG-1	9.45	43.78
MW-1	58.57	75.55
MW-2	25.35	48.13
MW-3	17.75	43.60
MW-4	11.47	25.74
MW-5	21.90	46.96
MW-6	7.03	27.93
MW-7	15.50	17.64
MW-8	36.65	49.68

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): ___

Well Information

Well ID: MW-4 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 25.74 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 8.65 ft Casing Volume: 2.78 gallons

Height of Water Column: 17.09 ft Cal. 3 Volumes: 8.35 gallons

Purge Information

Date Purged: 05 / 25 / 16 Start Time: 1135 Finish: 1330 Purge Rate: 100 mL/min

Purging Method: peristaltic Total Volume Purged: 11,500 ~~gallons~~ mL

Sampling Information

Date Collected: 05/25/16 Time Collected: 1335 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 20.9 Time: 1335

Sample pH (s.u.): 6.5 Time: ___

Specific Cond. (uS): 876 Time: ___

ReDox (mV): -41.6 Time: ___

Odor: none Time: ___

Turbidity (ntu): 25.2 Time: 1335

Diss Oxy (mg/L): 0.1 Time: ___

Res. Cl (mg/L): ___ Time: ___

Other: Fe: 1 mg/L Time: ___

Appearance: clear

General/Weather Observations

Sunny, 80°F, wind 2-5mph

Sampler Signature/Date: [signature] / 05/25/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft) Other
1140	6.5	1039	-82.6	5.7	0.5	19.7	500 mL	10.25
1145	6.5	1033	-88.6	8.1	0.2	20.0	1000 mL	10.90
1150	6.5	1003	-90.2	13.4	0.4	20.2	1500 mL	11.34
1155	6.5	958	-87.6	30.4	0.5	19.8	2000 mL	11.60
1200	6.5	908	-82.4	48.9	0.3	19.8	2500 mL	11.73

Client: HDR

Location: Monroe, NC

Project: Brickhaven

Well ID: MW-4

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water Other level (ft)
1210	6.5	889	-77.0	49.6	0.4	20.3	3500 mL	11.82
1220	6.5	863	-71.0	43.0	0.4	20.2	4500 mL	11.85
1230	6.5	872	-67.6	33.3	0.2	20.0	5500 mL	11.85
1240	6.5	860	-59.2	30.2	0.3	20.3	6500 mL	11.85
1250	6.5	861	-55.1	27.1	0.2	20.6	7500 mL	11.85
1300	6.5	858	-45.0	26.8	0.2	20.5	8500 mL	11.85
1310	6.5	865	-44.3	32.6	0.1	21.0	9500 mL	11.85
1320	6.5	870	-43.2	28.8	0.1	20.4	10500 mL	11.85
1330	6.5	873	-40.8	25.6	0.1	20.9	11500 mL	11.85

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES MAH / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-5 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 46.96 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 22.18 ft Casing Volume: 4.52 gallons

Height of Water Column: 27.78 ft Cal. 3 Volumes: 13.58 gallons

Purge Information

Date Purged: 05 / 25 / 16 Start Time: 1405 Finish: 1525 Purge Rate: 100 mL/min

Purging Method: Plastic 150 ft Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 05/25/16 Time Collected: 1530 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 23.2 Time: 1530 Turbidity (ntu): 8.2 Time: 1530

Sample pH (s.u.): 7.0 Time: Diss Oxy (mg/L): 2.0 Time:

Specific Cond. (uS): 371.4 Time: Res. Cl (mg/L): — Time:

ReDox (mV): 65.6 Time: Other: Iron: N/D Time:

Odor: none Time: Appearance: clear

General/Weather Observations

Sunny 45°F. Wind: 2-5 mph

Sampler Signature/Date: [signature] 05/25/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft) Other
1410	7.0	436.6	148.3	9.0	3.6	21.7	500 mL	22.67
1415	7.1	418.2	141.5	22.5	3.6	22.4	1000 mL	23.82
1420	7.0	397.4	135.4	57.1	3.8	21.2	1500 mL	24.79
1425	7.0	381.3	127.5	69.7	3.4	21.6	2000 mL	25.70
1435	7.0	276.6	117.2	49.8	2.9	23.3	3000 mL	27.05

Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-5

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water Level Other (ft)
1445	7.0	364.6	94.8	28.9	2.6	23.4	4000 mL	28.37
1455	7.0	365.1	81.5	13.4	2.3	23.6	5000 mL	29.53
1505	7.0	368.1	72.1	11.1	2.2	23.4	6000 mL	30.63
1515	7.0	370.9	68.7	9.5	2.0	24.6	7000 mL	31.42
1520	7.0	372.7	68.5	8.1	2.0	24.5	7500 mL	31.81
1525	7.0	373.7	66.6	8.2	2.0	23.7	8000 mL	32.20

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Buckhaven

Name and Afiliation (Sampler(s)): OES, MAH / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 05/25/16 Time Collected: 1030 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 18.6 Time: 1030 Turbidity (ntu): 447.4 Time: 1030

Sample pH (s.u.): 5.8 Time: _____ Diss Oxy (mg/L): 9.0 Time: 1030

Specific Cond. (uS): 100.3 Time: _____ Res. Cl (mg/L): — Time: —

ReDox (mV): 163.2 Time: _____ Other: Iron, N/D Time: 1030

Odor: None Time: _____ Appearance: Cloudy / Muddy

General/Weather Observations

Sunny, 75°F, 6 mph

Sampler Signature/Date: [signature] 05/25/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / PACE

Name and Afiliation (Inspector): ___

Well Information

Well ID: SW-2 Well Locked: YES NO

Well Diameter: ___ Construction: PVC Steel Stainless Steel

Total Well Depth: ___ ft Multi Factor*: ___ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ___ ft Casing Volume: ___ gallons

Height of Water Column: ___ ft Cal. 3 Volumes: ___ gallons

Purge Information

Date Purged: ___/___/___ Start Time: ___ Finish: ___ Purge Rate: ___

Purging Method: ___ Total Volume Purged: ___ gallons

Sampling Information

Date Collected: 05/25/16 Time Collected: 1000 (am) pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 20.4 Time: 1000 Turbidity (ntu): 143.7 Time: 1000

Sample pH (s.u.): 6.6 Time: ___ Diss Oxy (mg/L): 6.9 Time: 1000

Specific Cond. (uS): 186.4 Time: ___ Res. Cl (mg/L): — Time: —

ReDox (mV): 72.4 Time: ___ Other: Iron: N/D Time: ___

Odor: None Time: — Appearance: Cloudy / Muddy

General/Weather Observations

Sunny 70°F Calm. Humid

Sampler Signature/Date: [signature] / 05/25/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Field Data Sheet

Client: HDR Location: Mancure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / PAC

Name and Afiliation (Inspector): —

Well Information

Well ID: Leachate -1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ____/____/____ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 05/25/16 Time Collected: 1430 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 24.8 Time: 1430

Sample pH (s.u.): 8.2 Time: _____

Specific Cond. (uS): 615 Time: _____

ReDox (mV): 101.8 Time: _____

Odor: None Time: _____

Turbidity (ntu): 13.2 Time: 1430

Diss Oxy (mg/L): 6.6 Time: 1430

Res. Cl (mg/L): — Time: —

Other: Iron N/A Time: 1430

Appearance: Clear

General/Weather Observations

Sunny 85°F Wind 2-5mph

Sampler Signature/Date: [signature] / 05/25/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 1 of ___
	Document Number: F-CAR-FLD-001-rev.00	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: BG-1 Well Locked: YES NO

Well Diameter: 2" Construction: PVC Steel Stainless Steel

Total Well Depth: 43.78 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 9.38 ft Casing Volume: 5.60 gallons

Height of Water Column: 34.40 ft Cal. 3 Volumes: 16.82 gallons

Purge Information

Date Purged: 05/26/16 Start Time: 0940 Finish: 0955 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 1500 mL ~~gallons~~

Sampling Information

Date Collected: 05/26/16 Time Collected: 1000 am pm

Sampling Equipment Used: Peristaltic

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 16.5 Time: 1000 Turbidity (ntu): 1.7 Time: 1000

Sample pH (s.u.): 6.8 Time: Diss Oxy (mg/L): 1.4 Time:

Specific Cond. (uS): 1226 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 224.5 Time: Other: Iron, N/D Time:

Odor: none Time: Appearance: clear

General/Weather Observations

Sunny, 75°F, calm

Sampler Signature/Date: [signature] 05/26/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other: water level (ft)
0945	6.7	1235	182.4	3.3	1.6	16.5	500 mL	10.15
0950	6.8	1228	197.5	3.0	1.4	16.6	1000 mL	11.16
0955	6.8	1224	218.2	2.4	1.4	16.4	1500 mL	11.72

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Field Data Sheet

Client: HDR Location: Mooresville, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-6 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 27.93 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 6.78 ft Casing Volume: 3.44 gallons

Height of Water Column: 21.15 ft Cal. 3 Volumes: 10.34 gallons

Purge Information

Date Purged: 05/26/16 Start Time: 1040 Finish: 1235 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 11,500 ~~gallons~~ mL

Sampling Information

Date Collected: 05/26/16 Time Collected: 1240 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 18.1 Time: 1240

Sample pH (s.u.): 6.4 Time: ___

Specific Cond. (uS): 1179 Time: ___

ReDox (mV): 57.5 Time: ___

Odor: none Time: ___

Turbidity (ntu): 8.3 Time: 1240

Diss Oxy (mg/L): 0.2 Time: ___

Res. Cl (mg/L): — Time: —

Other: Iron, N/D Time: ___

Appearance: clear

General/Weather Observations

Sunny 80°F. Calm

Sampler Signature/Date: [signature] / 05/26/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft) Other
1045	6.6	1496	181.8	2.2	0.2	17.6	500 mL	7.90
1050	6.7	1485	172.9	88.6	0.1	17.5	1000 mL	8.53
1055	6.6	1470	161.2	89.3	0.1	17.3	1500 mL	8.89
1105	6.6	1375	121.4	66.5	0.2	17.4	2500 mL	9.15
1115	6.5	1319	80.8	50.6	0.2	17.4	3500 mL	9.34

Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-6

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other
1125	6.5	1218	67.3	44.5	0.1	17.4	4500 mL	9.40
1135	6.5	1196	63.6	40.3	0.1	17.5	5500 mL	9.46
1145	6.4	1173	60.4	34.2	0.1	17.4	6500 mL	9.49
1155	6.4	1187	60.1	25.2	0.1	18.2	7500 mL	9.04
1205	6.4	1181	58.8	17.5	0.2	18.0	8500 mL	8.78
1215	6.4	1187	58.9	16.2	0.2	18.1	9500 mL	8.63
~~1214~~ 1225	6.4	1161	58.3	11.4	0.2	18.1	10500 mL	8.57
1230	6.4	1213	59.1	10.0	0.2	18.2	11000 mL	8.56
1235	6.4	1145	57.7	8.1	0.2	18.2	11,500 mL	8.55

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 17.64 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 15.65 ft Casing Volume: 0.32 gallons

Height of Water Column: 1.99 ft Cal. 3 Volumes: 0.97 gallons

Purge Information

Date Purged: 05/26/16 Start Time: 1320 Finish: 1350 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 3000 mL ~~gallons~~

Sampling Information

Date Collected: 05/26/16 Time Collected: 1355 am (pm)

Sampling Equipment Used: Peristaltic

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 20.9 Time: 1355 Turbidity (ntu): 2.9 Time: 1355

Sample pH (s.u.): 6.9 Time: Diss Oxy (mg/L): 3.8 Time: 1355

Specific Cond. (uS): 1897 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 17.9 Time: Other: Iron N/D Time: 1355

Odor: None Time: Appearance: clear

General/Weather Observations

Sunny 88°F. wind 5-10mph. (Sampled while purging)

Sampler Signature/Date: [signature] / 05/26/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Other (ft) Water Level
1325	6.9	1870	-116.0	6.4	0.5	20.4	500mL	15.85
1330	6.9	1829	-72.2	8.4	1.6	21.3	1000mL	16.05
1335	6.9	1847	-21.9	6.0	2.4	21.2	1500mL	16.20
1340	6.9	1864	7.6	3.5	3.7	21.7	2000mL	16.39
1345	6.9	1867	15.2	3.2	3.6	21.7	2500mL	16.57

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Client: HDR

Location: Monroe, NC

Project: Charlah - Brickhaven

Well ID: MW-7

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (ml)	(ft) Other
1350	6.9	1875	25.2	3.1	3.8	21.7	3000ml	Water level 16.82

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s)): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-8 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 49.68 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ~~39.95~~ MH ft 35.95 Casing Volume: 2.23 gallons

Height of Water Column: 13.73 ft Cal. 3 Volumes: 6.71 gallons

Purge Information

Date Purged: 05/26/16 Start Time: 1430 Finish: 1520 Purge Rate: 100 mL/Min

Purging Method: Plastic 150" Total Volume Purged: 5500 ~~gallons~~ mL

Sampling Information

Date Collected: 05/26/16 Time Collected: 1525 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 19.8 Time: 1525 Turbidity (ntu): 5.3 Time: 1525

Sample pH (s.u.): 7.0 Time: Diss Oxy (mg/L): 1.7 Time: 1525

Specific Cond. (uS): 2467 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 70.3 Time: Other: Iron: N/D Time: 1525

Odor: None Time: Appearance: Clear

General/Weather Observations

Sunny 90°F. Wind, 5-10mph

Sampler Signature/Date: [signature] /05/26/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Other (ft) Water Level
1435	6.8	3858	126.7	26.4	3.3	22.0	500mL	36.29
1440	6.8	3849	94.6	25.1	3.4	20.5	1000mL	36.48
1445	6.8	3826	89.6	24.3	3.0	21.8	1500mL	36.67
1450	6.9	3717	90.6	18.0	3.1	20.2	2500 mL	36.90
1500 ~~1455~~ MH	6.9	3246	85.4	11.8	2.5	19.1	~~3000~~ MH mL 3500mL	37.39

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Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-8

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level Other (ft)
1505	6.9	3017	81.7	8.4	2.1	19.3	4000 mL	37.56
1510	7.0	2783	78.3	6.6	1.9	18.9	4500 mL	37.66
1515	7.0	2660	75.5	6.1	1.7	19.2	5000 mL	37.69
1520	7.0	2528	72.0	5.6	1.7	19.2	5500 mL	37.69

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-1 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 75.55 ft Multi Factor*: 1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 58.48 ft Casing Volume: 2.78 gallons

Height of Water Column: 17.07 ft Cal. 3 Volumes: 8.34 gallons

Purge Information

Date Purged: 05 / 27 / 16 Start Time: 0935 Finish: 1100 Purge Rate: 100 mL/min

Purging Method: plastic 150 ft Total Volume Purged: 8500 mL gallons

Sampling Information

Date Collected: 05/27/16 Time Collected: 1105 (am) pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required
		FD: 1120

Field Measurements/Observations

Sample Temp (°C): 22.3 Time: 1105 Turbidity (ntu): 4.2 Time: 1105

Sample pH (s.u.): 6.8 Time: Diss Oxy (mg/L): 0.2 Time:

Specific Cond. (uS): 1332 Time: Res. Cl (mg/L): — Time:

ReDox (mV): ~10.1 Time: Other: Iron: N/D Time:

Odor: none Time: Appearance: clear

General/Weather Observations

Sunny. 70°F. Wind: 10-15mph FD: 1120

Sampler Signature/Date: [signature] 05/27/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft)
0940	7.2	529.7	74.1	33.9	1.7	19.8	500 mL	58.59
0945	7.2	530.2	30.0	41.6	1.3	19.6	1000 mL	58.63
0950	7.2	528.6	-6.9	33.2	1.0	20.3	1500 mL	58.62
0955 1000	7.2	538.2	-23.6	21.6	0.7	21.6	2500 mL	58.59
1010	7.3	539	-24.5	18.8	0.6	24.1	3500 mL	58.56

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Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level Other (ft)
1020	7.2	537.8	-38.0	14.1	0.5	20.5	4500 mL	58.64
1030	7.2	607	-40.4	7.4	0.3	20.2	5500 mL	58.75
1035	6.9	1027	-23.8	6.7	0.2	18.1	6000 mL	58.73
1040	6.9	1074	-20.7	4.8	0.3	19.2	6500 mL	58.80
1045	6.9	1200	-16.5	3.7	0.4	19.8	7000 mL	58.70
1050	6.8	1288	-11.3	5.6	0.3	20.4	7500 mL	58.65
1055	6.8	1318	-10.7	5.0	0.3	21.6	8000 mL	58.60
1100	6.8	1324	-10.3	4.0	0.2	22.1	8500 mL	58.60

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Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector):

Well Information

Well ID: MW-2 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 48.13 ft Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 24.80 ft Casing Volume: 3.80 gallons

Height of Water Column: 23.33 ft Cal. 3 Volumes: 11.40 gallons

Purge Information

Date Purged: 05/27/16 Start Time: 1150 Finish: 1335 Purge Rate: 100 mL/min

Purging Method: Plastic 150" Total Volume Purged: 10,500 mL ~~gallons~~

Sampling Information

Date Collected: 05/27/16 Time Collected: 1340 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 29.8 Time: 1340 Turbidity (ntu): 9.1 Time: 1340

Sample pH (s.u.): 7.9 Time: Diss Oxy (mg/L): 1.9 Time:

Specific Cond. (uS): 4576 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 77.7 Time: Other: Iron, N/D Time:

Odor: None Time: — Appearance: Clear

General/Weather Observations

Sunny 80°F. Wind: 5-10mph

Sampler Signature/Date: [signature] 05/27/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Other water level (ft)
1155	8.4	4467	129.0	7.7	3.3	23.8	500 mL	24.73
1200	8.0	4540	130.2	26.0	2.4	25.0	1000 mL	25.25
1205	7.9	4559	130.5	24.2	2.3	25.6	1500 mL	25.61
1215	7.9	4575	125.2	21.0	2.0	25.8	2500 mL	26.25
1225	7.9	4571	119.6	19.6	2.1	28.2	3500 mL	26.62

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Client: HDR

Location: Moncure, NC

Project: Cherrah - Brickhaven

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (ml)	(ft) Other water Level
1235	7.9	4566	109.0	16.4	2.2	25.4	4500	27.29
1245	7.9	4561	100.9	14.5	2.2	23.9	5500	28.19
1255	7.9	4549	90.3	13.1	1.9	26.5	6500	28.90
1305	7.9	4559	85.4	11.5	1.9	28.1	7500	29.64
1315	7.9	4564	80.6	11.5	1.9	27.5	8500	30.03
1325	7.9	4570	74.3	11.7	1.8	28.2	9500	30.56
1335	7.9	4578	77.6	10.0	1.9	29.7	10,500	30.85

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Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-3 Well Locked: (YES) NO

Well Diameter: 2" Construction: (PVC) Steel Stainless Steel

Total Well Depth: 43.60 ft Multi Factor*: 0.630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 10.35 ft Casing Volume: 5.41 gallons

Height of Water Column: 33.25 ft Cal. 3 Volumes: 16.25 gallons

Purge Information

Date Purged: 05 / 27 / 16 Start Time: 1445 Finish: 1500 Purge Rate: 100 mL/min

Purging Method: Peristaltic Total Volume Purged: 1500 ~~gallons~~ mL

Sampling Information

Date Collected: 05/27/16 Time Collected: 1505 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 21.0 Time: 1505 Turbidity (ntu): 2.3 Time: 1505

Sample pH (s.u.): 7.4 Time: Diss Oxy (mg/L): 1.6 Time:

Specific Cond. (uS): 4357 Time: Res. Cl (mg/L): — Time: —

ReDox (mV): 131.6 Time: Other: Iron: N/D Time:

Odor: None Time: Appearance: Clear

General/Weather Observations

Sunny 90°F. Wind: 10-15 mph

Sampler Signature/Date: [signature] / 05/27/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft)
1450	7.4	4381	134.1	3.6	1.7	20.0	500 mL	11.41
1455	7.4	4385	133.8	2.4	1.8	19.3	1000 mL	12.95
1500	7.4	4357	131.2	2.6	1.6	21.0	1500 mL	13.59

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s)): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-3

Well Diameter: 2"

Total Well Depth: 43.60 ft

Static Water Level: 17.75 ft

Height of Water Column: 25.85 ft

Well Locked: YES NO

Construction: PVC Steel Stainless Steel

Multi Factor*: 0.1630 [(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 4.21 gallons

Cal. 3 Volumes: 12.64 gallons

Purge Information

Date Purged: 07 / 11 / 16 Start Time: ~~33~~ 1530 Finish: 1550 Purge Rate: 100mL/min

Purging Method: Peristaltic Total Volume Purged: 2000 ~~gallons~~ mL

Sampling Information

Date Collected: 07/11/16 Time Collected: 1555 am (pm)

Sampling Equipment Used: GSG

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 24.5 Time: 1555

Sample pH (s.u.): 7.3 Time: ___

Specific Cond. (uS): 4270 Time: ___

ReDox (mV): 95.6 Time: ___

Odor: none Time: ___

Turbidity (ntu): 0.4 Time: 1555

Diss Oxy (mg/L): 1.1 Time: ___

Res. Cl (mg/L): — Time: ___

Other: Iron, N/A Time: ___

Appearance: clear

General/Weather Observations

Cloudy, 82°F, Wind: 2-5 mph, Intake: 40.50

Sampler Signature/Date: [signature] / 07/11/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft) Other
1535	7.3	4267	110.5	2.4	2.2	24.7	500mL	18.1
1540	7.3	4282	102.8	0.9	1.3	24.3	1000mL	19.05
1545	7.3	4274	99.7	0.5	1.3	24.4	1500 mL	19.55
1550	7.3	4265	95.8	0.5	1.1	24.3	2000 mL	20.19

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: Leachate-1 Well Locked: YES NO

Well Diameter: _____ Construction: PVC Steel Stainless Steel

Total Well Depth: _____ ft Multi Factor*: _____ [(Radius/12)2 x 3.14 x 7.48]

Static Water Level: _____ ft Casing Volume: _____ gallons

Height of Water Column: _____ ft Cal. 3 Volumes: _____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ gallons

Sampling Information

Date Collected: 07/11/16 Time Collected: 1415 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 31.1 Time: 1415 Turbidity (ntu): 12.4 Time: 1415

Sample pH (s.u.): 7.6 Time: | Diss Oxy (mg/L): 4.7 Time: |

Specific Cond. (uS): 919 Time: | Res. Cl (mg/L): — Time: |

ReDox (mV): 156.4 Time: | Other: Iron: N/D Time: |

Odor: none Time: | Appearance: slightly cloudy

General/Weather Observations

Sunny 86°F Fair

Sampler Signature/Date: [signature] / 07/11/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-5

Well Diameter: 2"

Total Well Depth: ~~17~~ 46.96 ft

Static Water Level: 21.90 ft

Height of Water Column: 25.06 ft

Well Locked: YES NO

Construction: PVC Steel Stainless Steel

Multi Factor*: 0.163 [(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 4.08 gallons

Cal. 3 Volumes: 12.25 gallons

Purge Information

Date Purged: 07/11/16 Start Time: 1345 Finish: 1405 Purge Rate: 100 mL/min

Purging Method: Monsoon Total Volume Purged: 2000 mL ~~gallons~~

Sampling Information

Date Collected: 07/11/16 Time Collected: 1410 am pm

Sampling Equipment Used: GMS

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 30.5 Time: 1410

Sample pH (s.u.): 6.8 Time:

Specific Cond. (uS): 349.4 Time:

ReDox (mV): 130.2 Time:

Odor: none Time:

Turbidity (ntu): 4.4 Time: 1410

Diss Oxy (mg/L): 1.7 Time:

Res. Cl (mg/L): — Time:

Other: Iron: N/D Time:

Appearance: clear

General/Weather Observations

86°F fair, wind 7-9 mph. Intake.

Sampler Signature/Date: [signature] / 07/11/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water level Other (ft)
1350	7.0	347.0	170.4	7.0	2.4	25.3	500 mL	22.96
1355	6.9	347.1	152.4	5.5	1.9	27.7	1000 mL	23.27
1400	6.8	348.4	139.4	4.7	1.8	29.4	1500 mL	23.68
1405	6.8	348.6	133.1	3.5	1.7	30.3	2000 mL	23.94

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: ~~MW-8~~ MW-6

Well Diameter: 2"

Total Well Depth: 27.93 ft

Static Water Level: 7.03 ft

Height of Water Column: 20.9 ft

Well Locked: YES NO

Construction: PVC Steel Stainless Steel

Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 3.40 gallons

Cal. 3 Volumes: 10.22 gallons

Purge Information

Date Purged: 07 / 11 / 16 Start Time: 1025 Finish: 1235 Purge Rate: 100 mL/min

Purging Method: peristaltic Total Volume Purged: 13,000 ~~gallons~~ mL

Sampling Information

Date Collected: 07/11/16 Time Collected: 1240 am pm

Sampling Equipment Used: bailer

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 23.5 Time: 1240

Sample pH (s.u.): 6.4 Time: |

Specific Cond. (uS): 1111 Time: |

ReDox (mV): 107.1 Time: |

Odor: None Time: |

Turbidity (ntu): 26.9 Time: 1240

Diss Oxy (mg/L): 0.1 Time: |

Res. Cl (mg/L): — Time: —

Other: Iron N/D Time: |

Appearance: Cloudy

General/Weather Observations

Sunny, 88°F. Wind 2-5 mph. 2hr mark

Sampler Signature/Date: [signature] 07/11/16 pump depth: 27.0 ft

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water Other level (ft)
1030	6.6	1377	109.6	3.9	0.3	19.8	500	8.0
1035	6.4	1350	119.1	34.0	0.2	19.6	1000	8.6
1045	6.4	1285	114.9	93.1	0.1	19.6	~~1500~~ 2000	9.06
1055	6.4	1227	115.1	76.0	0.1	19.8	~~2~~ 3000 mL	8.95
1105	6.4	1210	113.2	76.4	0.1	21.9	4000 mL	8.41

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Client: HAR

Location: Monroe, NC

Project: Church - Brickhaven

Well ID: ~~MW-8~~ MW-6

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Other (Water Level) (ft)
1115	6.4	1176	111.3	65.6	0.1	21.5	5000mL	8.28
1125	6.4	1165	110.4	63.6	0.1	21.8	6000mL	8.12
1135	6.4	1152	111.6	58.1	0.1	22.3	7000mL	8.12
1145	6.4	1141	110.5	48.7	0.1	22.9	8000mL	7.97
1155	6.4	1136	109.1	41.4	0.2	23.1	9000mL	7.93
1205	6.4	1133	110.4	40.0	0.1	23.1	10000mL	7.92
1215	6.4	1126	108.9	44.1	0.1	23.4	11,000mL	7.93
1225	6.4	1110	105.7	34.1	0.1	23.9	12000mL	7.90
1235	6.4	1119	106.3	26.5	0.2	23.4	13000mL	7.93

- 2 hr mark!

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-7

Well Locked: (YES) NO

Well Diameter: 2"

Construction: (PVC) Steel Stainless Steel

Total Well Depth: 17.64 ft

Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 15.50 ft

Casing Volume: 0.34 gallons

Height of Water Column: 2.14 ft

Cal. 3 Volumes: 1.0 gallons

Purge Information

Date Purged: 07 / 11 / 16 Start Time: 0920 Finish: 0950 Purge Rate: 100 mL/min

Purging Method: peristaltic Total Volume Purged: 3000 mL ~~gallons~~

Sampling Information

Date Collected: 07/11/16 Time Collected: 0955 (am) pm

Sampling Equipment Used: grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 22.1 Time: 0955

Sample pH (s.u.): 6.9 Time: |

Specific Cond. (uS): 1831 Time: |

ReDox (mV): 12.1 Time: |

Odor: none Time: |

Turbidity (ntu): 2.2 Time: 0955

Diss Oxy (mg/L): 4.0 Time: |

Res. Cl (mg/L): — Time: |

Other: Iron: N/D Time: |

Appearance: clear

General/Weather Observations

76°F, fair, wind: 0-2 mph

Sampler Signature/Date: [signature] 07/11/16

pump depth: 17.0ft

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Water level (ft) Other
0925	6.9	1812	118.8	16.3	3.96	22.6	500 mL	15.65
0930	6.8	1792	-46.7	19.9	1.1	22.2	1000 mL	15.80
0935	6.8	1812	0.3	3.5	2.7	22.0	1500 mL	15.98
0940	6.8	1826	27.9	2.8	3.8	21.9	2000 mL	16.2
0945	6.9	1833	11.4	1.7	3.9	22.0	2500 mL	16.38

Client: HDR

Location: Moncore, NC

Project: Brickhaven

Well ID: MW-7

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed mL	Water level Other (ft)
0950	6.8	1831	12.2	2.0	3.9	21.9	3000	16.5

Field Data Sheet

Client: HDR
Location: Moncure, NC
Project Name/#: Brickhaven
Name and Afiliation (Sampler(s): CES, MAH / Pace
Name and Afiliation (Inspector): —

Well Information

Well ID: MW-1
Well Diameter: 2"
Total Well Depth: 75.55 ft
Static Water Level: 58.57 ft
Height of Water Column: 16.98 ft

Well Locked: YES NO
Construction: PVC Steel Stainless Steel
Multi Factor*: .1630 [*(Radius/12)2 x 3.14 x 7.48]
Casing Volume: 2.76 gallons
Cal. 3 Volumes: 8.3 gallons

Purge Information

Date Purged: 07/12/16 Start Time: ~~1350~~ 1345 MH Finish: 1445 Purge Rate: 100 mL/min
Purging Method: Monsoon Total Volume Purged: 6000 ~~gallons~~ mL

Sampling Information

Date Collected: 07/12/16 Time Collected: 1450 am pm
Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 18.5 Time: 1450
Sample pH (s.u.): 6.5 Time: —
Specific Cond. (uS): 2050 Time: —
ReDox (mV): 63.3 Time: —
Odor: None Time: —

Turbidity (ntu): 8.4 Time: 1450
Diss Oxy (mg/L): 0.1 Time: —
Res. Cl (mg/L): — Time: —
Other: Iron: N/D Time: —
Appearance: Clear
FD: 1515

General/Weather Observations

Sunny, 83°F Humid Calm. Good recharge. Intake: 73.00 ft

Sampler Signature/Date: [signature] 07/12/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water Level (ft) Other
1350	7.2	521.1	81.4	168.4	1.3	18.7	500	59.0
1355	7.1	544.1	11.4	121.8	0.2	18.5	1000	59.15
1415	6.6	1729	45.8	36.1	0.1	18.6	3000	59.23
1425	6.6	1901	55.0	14.4	0.1	18.4	4000	59.30
1430	6.6	1953	57.5	13.9	0.1	18.6	4500mL	59.32

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Client: HDR

Location: Moncure, NC

Project: Charah - Brickhaven

Well ID: MW-1

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water Level Other (ft)
1435	6.5	2005	59.5	10.2	0.1	18.5	5000mL	59.33
1440	6.5	2020	60.9	10.00	0.1	18.6	5500mL	59.34
1445	6.5	2040	63.1	7.8	0.1	18.6	6000mL	59.34

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-2

Well Diameter: 2"

Total Well Depth: 48.13 ft

Static Water Level: 25.35 ft

Height of Water Column: 22.78 ft

Well Locked: (YES) NO

Construction: (PVC) Steel Stainless Steel

Multi Factor*: .1632 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 3.71 gallons

Cal. 3 Volumes: 11.13 gallons

Purge Information

Date Purged: 07/12/16 Start Time: 1520 Finish: 1735 Purge Rate: 100 ml/min

Purging Method: Variable speed (Monsoon) Total Volume Purged: 13500 ~~gallons~~ ml

Sampling Information

Date Collected: 07/12/16 Time Collected: 1740 am (pm)

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 25.4 Time: 1740

Sample pH (s.u.): 8.5 Time: ___

Specific Cond. (uS): 4413 Time: ___

ReDox (mV): ~~110.0~~ 110.0 Time: ___

Odor: None Time: ___

Turbidity (ntu): 9.4 Time: 1740

Diss Oxy (mg/L): 2.5 Time: ___

Res. Cl (mg/L): — Time: ___

Other: Iron, N/D Time: ___

Appearance: Clear

General/Weather Observations

Sunny, 90°F. Humid. Calm. No recharge

intake: 46.0 ft

Sampler Signature/Date: [signature] / 07/12/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed mL	Water level (ft) Other
1525	7.7	4381	46.5	56.0	2.1	25.0	500	27.65
1535	7.6	4386	58.1	~~58.1~~ 52.4	1.7	25.8	1500	28.65
1545	7.6	4384	73.3	62.2	1.9	24.3	8500	29.89
1605	7.7	4368	83.4	53.4	1.8	24.6	4500	31.88
1625	8.0	4375	90.9	34.0	1.9	25.3	6500	33.41

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Client: HDR

Location: Monroe, NC

Project: Clash - Bockhaven

Well ID: MW-2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed mL	Other (ft) water level
1645	4.2	4380	94.8	27.7	2.0	27.0	~~34.08~~ 8500	34.08
1705	4.4	4425	105.7	18.3	3.0	26.8	~~34.85~~ 9500	34.85
1725	4.5	4402	101.8	11.0	2.5	26.5	12500	35.55
1730	4.5	4419	102.6	10.0	2.6	26.3	13000	35.86
1735	4.5	4400	102.7	9.7	2.5	25.8	13500	

Field Data Sheet

Client: HDR
Location: Monroe, NC
Project Name/#: Charah - Brickhaven
Name and Afiliation (Sampler(s)): OES, MAH / PACE
Name and Afiliation (Inspector): —

Well Information

Well ID: MW-8
Well Diameter: 2"
Total Well Depth: 49.68 ft
Static Water Level: 36.65 ft
Height of Water Column: 13.03 ft

Well Locked: (YES) NO
Construction: (PVC) Steel Stainless Steel
Multi Factor*: .1630 [(Radius/12)2 x 3.14 x 7.48]
Casing Volume: 2.12 gallons
Cal. 3 Volumes: 6.37 gallons

Purge Information

Date Purged: 07/12/16 Start Time: 1150 Finish: 1255 Purge Rate: 100 ml/min
Purging Method: Monsoon Total Volume Purged: 6500 mL ~~gallons~~

Sampling Information

Date Collected: 07/12/16 Time Collected: 1300 am (pm)
Sampling Equipment Used: GrD

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 21.7 Time: 1300
Sample pH (s.u.): 6.9 Time:
Specific Cond. (uS): 2027 Time:
ReDox (mV): 77.5 Time:
Odor: None Time:

Turbidity (ntu): 7.8 Time: 1300
Diss Oxy (mg/L): 1.1 Time:
Res. Cl (mg/L): — Time: —
Other: Iron: N/D Time:
Appearance: Clear

General/Weather Observations

Sunny 80°F, Humid, Calm Intake: 47.00 ft

Sampler Signature/Date: [signature] / 07/12/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Other (ft) Water Level
1155	6.8	3486	221.2	157.7	4.4	22.1	500 mL	37.13
1205	6.8	3436	159.9	80.0	3.8	21.3	1500 mL	37.50
1215	6.8	3001	124.6	41.1	3.1	21.3	2500 mL	37.80
1225	6.9	2593	102.6	14.0	2.3	21.7	3500	37.95
1230	6.9	2436	98.2	14.5	2.0	22.0	4000	37.98

Pace Analytical	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
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Client: HDR

Location: Monroe, NC

Project: Church - Brickhaven

Well ID: MW-8

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water level Other (ft)
1235	6.9	2287	95.1	11.1	1.6	21.8	4500	38.0
1240	6.9	2186	89.5	9.7	1.4	21.9	5000	38.02
1245	6.9	2115	83.4	9.7	1.3	22.0	5500	38.02
1250	6.9	2073	81.0	8.6	1.2	22.0	6000	38.03
1255	6.9	2032	78.3	9.1	1.2	21.8	6500	38.03

Field Data Sheet

Client: HDR
Location: Moncure, NC
Project Name/#: Charah - Brickhaven
Name and Afiliation (Sampler(s)): CES, MAH / PAF
Name and Afiliation (Inspector): —

Well Information

Well ID: 156-1
Well Locked: YES NO
Well Diameter: 2"
Construction: PVC Steel Stainless Steel
Total Well Depth: 43.78 ft
Multi Factor*: .1630 [(Radius/12)2 x 3.14 x 7.48]
Static Water Level: 9.45 ft
Casing Volume: 5.59 gallons
Height of Water Column: 34.33 ft
Cal. 3 Volumes: 16.78 gallons

Purge Information

Date Purged: 07 / 12 / 16 Start Time: 1050 Finish: 1110 Purge Rate: 100 mL/min
Purging Method: Peristaltic Total Volume Purged: 2000 mL ~~gallons~~

Sampling Information

Date Collected: 07/12/16 Time Collected: 1115 am pm
Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 18.4 Time: 1115
Sample pH (s.u.): 6.5 Time:
Specific Cond. (uS): 1197 Time:
ReDox (mV): 203.5 Time:
Odor: None Time:
Turbidity (ntu): 0.3 Time: 1115
Diss Oxy (mg/L): 1.3 Time:
Res. Cl (mg/L): — Time: —
Other: Iron: N/D Time:
Appearance: Clear

General/Weather Observations

partly cloudy, 77°F, wind 0-2 mph

Sampler Signature/Date: [signature] / 07/12/16

intake: 40.0 (ft)

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed mL	Water Level (ft)
1055	6.5	1207	149.2	0.6	2.6	18.6	500	10.05
1100	6.4	1203	178.1	0.4	1.5	18.1	1000mL	11.20
1105	6.5	1204	192.7	0.4	1.4	18.1	1500mL	11.90
1110	6.5	1206	203.3	0.3	1.3	18.4	2000mL	12.32

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Clough-Brickhaven

Name and Afiliation (Sampler(s)): CES, MAH / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: SW-1

Well Locked: YES NO

Well Diameter: ___

Construction: PVC Steel Stainless Steel

Total Well Depth: ___ ft

Multi Factor*: ___ [(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ___ ft

Casing Volume: ___ gallons

Height of Water Column: ___ ft

Cal. 3 Volumes: ___ gallons

Purge Information

Date Purged: ___/___/___ Start Time: ___ Finish: ___ Purge Rate: ___

Purging Method: ___ Total Volume Purged: ___ gallons

Sampling Information

Date Collected: 07/12/16 Time Collected: 1030 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 25.9 Time: 1030

Sample pH (s.u.): 6.7 Time: /

Specific Cond. (uS): 69.0 Time: /

ReDox (mV): 97.8 Time: /

Odor: None Time: /

Turbidity (ntu): 116.6 Time: 1030

Diss Oxy (mg/L): 5.3 Time: /

Res. Cl (mg/L): — Time: —

Other: Iron: N/D Time: /

Appearance: Cloudy / Clay like

General/Weather Observations

Sunny. 78°F. Humid. Calm.

Sampler Signature/Date: Chad Sorrell 07/12/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Field Data Sheet

Client: HDR Location: Moncure, NC Project Name/#: Charah-Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / PACE

Name and Afiliation (Inspector): —

Well Information

Well ID: JW-2

Well Locked: YES NO

Well Diameter: ____

Construction: PVC Steel Stainless Steel

Total Well Depth: ____ ft

Multi Factor*: ____ [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: ____ ft

Casing Volume: ____ gallons

Height of Water Column: ____ ft

Cal. 3 Volumes: ____ gallons

Purge Information

Date Purged: ___/___/___ Start Time: ____ Finish: ____ Purge Rate: ____

Purging Method: ____ Total Volume Purged: ____ gallons

Sampling Information

Date Collected: 07/12/16 Time Collected: 0930 am pm

Sampling Equipment Used: Grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 24.5 Time: 0930

Sample pH (s.u.): 6.4 Time: /

Specific Cond. (uS): 130.9 Time: /

ReDox (mV): 14.6 Time: /

Odor: None Time: /

Turbidity (ntu): 210.7 Time: 0930

Diss Oxy (mg/L): 4.9 Time: /

Res. Cl (mg/L): — Time: /

Other: Iron: 1.5 mg/L Time: /

Appearance: Muddy / clay/like

General/Weather Observations

Sunny 72°F. Humid Calm. Area Flooded

Sampler Signature/Date: [signature] 07/12/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed	Other

Field Data Sheet

Client: HDR Location: Monroe, NC Project Name/#: Brickhaven

Name and Afiliation (Sampler(s): CES, MAH / Pace

Name and Afiliation (Inspector): —

Well Information

Well ID: MW-4

Well Locked: (YES) NO

Well Diameter: 2"

Construction: (PVC) Steel Stainless Steel

Total Well Depth: 25.74 ft

Multi Factor*: 0.1630 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 11.47 ft

Casing Volume: 2.33 gallons

Height of Water Column: 14.27 ft

Cal. 3 Volumes: 6.98 gallons

Purge Information

Date Purged: 07 / 13 / 16 Start Time: 1010 Finish: 1105 Purge Rate: 100 mL/min

Purging Method: peristaltic Total Volume Purged: 5500 mL ~~gallons~~

Sampling Information

Date Collected: 07/13/16 Time Collected: 1110 (am) pm

Sampling Equipment Used: grab

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): 23.0 Time: 1110

Sample pH (s.u.): 6.3 Time:

Specific Cond. (uS): 1746 Time:

ReDox (mV): -11.3 Time:

Odor: none Time:

Turbidity (ntu): 5.7 Time: 1110

Diss Oxy (mg/L): 0.2 Time:

Res. Cl (mg/L): — Time:

Other: Iron: 2.8 mg/L Time:

Appearance: clear

General/Weather Observations

fair, 80°F, wind: 5-7 mph, near by pond dewatered, Intake depth: 22.0 ft

Sampler Signature/Date: [signature] 07/13/16

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water Level ~~Other~~ (ft)
1015	6.3	1243	-29.8	3.6	1.6	22.0	500	12.02
1020	6.4	1197	-36.3	2.6	0.8	22.4	1000	12.34
1025	6.4	1195	-36.7	2.1	0.5	22.4	1500	12.52
1030	6.4	1196	-36.8	1.6	0.3	22.3	2000	12.63
1035	6.4	1339	-38.2	1.4	0.3	22.5	2500	12.67

Pace Analytical®	Document Name: Field Data Sheet	Document Issued: April 6, 2015 Page 2 of _____
	Document Number: F-CAR-FLD-001.rev.011	Issueing Authority: Pace Huntersville Quality Office

Client: HDR

Location: Moncure, NC

Project: Brickhaven

Well ID: MW-4

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1080
2	0.1650
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	pH (s.u.)	Spec. Cond. (uS)	ReDox (mV)	Turbidity (ntu)	Diss Oxy. (mg/L)	Temp. (°C)	Volume Removed (mL)	Water level Other (ft)
1040	6.3	1558	-40.6	4.6	0.2	22.6	3000	12.69
1045	6.3	1669	-36.8	7.6	0.2	22.4	3500	12.71
1050	6.3	1715	-26.8	9.4	0.2	22.9	4000	12.72
1055	6.3	1723	-23.1	8.1	0.2	22.9	4500	12.74
1100	6.3	1752	-15.4	8.5	0.2	23.1	5000	12.74
1105	6.3	1757	-12.0	6.1	0.2	23.3	5500	12.75

B

Appendix B – 7th & 8th Round Laboratory Reports and Chains of Custody

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 27, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on May 26, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92299214001	**SW-2**	Water	05/25/16 10:00	05/26/16 14:50
92299214002	**SW-1**	Water	05/25/16 10:30	05/26/16 14:50
92299214003	**MW-4**	Water	05/25/16 13:35	05/26/16 14:50
92299214004	**MW-5**	Water	05/25/16 15:30	05/26/16 14:50
92299214005	**LEACHATE -1**	Water	05/25/16 14:30	05/26/16 14:50
92299214006	**AMBIENT BLANK**	Water	05/25/16 11:40	05/26/16 14:50
92299214007	**EQ. BLANK**	Water	05/25/16 12:30	05/26/16 14:50
92299214008	**TRIP BLANK**	Water	05/25/16 07:30	05/26/16 14:50

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92299214001	**SW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299214002	**SW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299214003	**MW-4**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299214004	**MW-5**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299214005	**LEACHATE -1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299214006	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92299214007	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
92299214008	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299214001	**SW-2**					
EPA 300.0	Chloride	14.9	mg/L	1.0	06/01/16 18:01	
EPA 300.0	Fluoride	0.12	mg/L	0.10	06/01/16 18:01	
EPA 300.0	Sulfate	15.0	mg/L	1.0	06/01/16 18:01	
EPA 6010	Barium	81.1	ug/L	5.0	05/31/16 19:47	
EPA 6010	Calcium	10900	ug/L	100	05/31/16 19:47	
EPA 6010	Chromium	5.6	ug/L	5.0	05/31/16 19:47	
EPA 6010	Copper	6.2	ug/L	5.0	05/31/16 19:47	
EPA 6010	Vanadium	11.0	ug/L	5.0	05/31/16 19:47	
EPA 6010	Zinc	16.6	ug/L	10.0	05/31/16 19:47	
EPA 6020B	Boron	29.3	ug/L	5.0	06/02/16 12:56	
EPA 6020B	Lithium	3.4	ug/L	0.50	06/02/16 12:56	
EPA 903.1	Radium-226	0.141 ± 0.322 (0.191) C:NA T:86%	pCi/L		06/20/16 13:27	
EPA 904.0	Radium-228	0.703 ± 0.459 (0.873) C:80% T:78%	pCi/L		06/13/16 19:35	
SM 2540C	Total Dissolved Solids	174	mg/L	25.0	05/27/16 17:47	
92299214002	**SW-1**					
EPA 300.0	Chloride	16.7	mg/L	1.0	06/01/16 18:22	
EPA 300.0	Fluoride	0.12	mg/L	0.10	06/01/16 18:22	
EPA 300.0	Sulfate	10.6	mg/L	1.0	06/01/16 18:22	
EPA 6010	Barium	177	ug/L	5.0	05/31/16 19:55	
EPA 6010	Calcium	5220	ug/L	100	05/31/16 19:55	
EPA 6010	Chromium	7.8	ug/L	5.0	05/31/16 19:55	
EPA 6010	Copper	7.9	ug/L	5.0	05/31/16 19:55	
EPA 6010	Lead	13.2	ug/L	5.0	05/31/16 19:55	
EPA 6010	Nickel	5.2	ug/L	5.0	05/31/16 19:55	
EPA 6010	Vanadium	25.1	ug/L	5.0	05/31/16 19:55	
EPA 6010	Zinc	25.8	ug/L	10.0	05/31/16 19:55	
EPA 6020B	Boron	15.0	ug/L	5.0	06/02/16 13:02	
EPA 6020B	Lithium	6.8	ug/L	0.50	06/02/16 13:02	
EPA 8260	Methylene Chloride	1.1	ug/L	1.0	05/28/16 01:23	B,C9
EPA 903.1	Radium-226	0.536 ± 1.29 (2.49) C:NA T:24%	pCi/L		06/20/16 13:53	
EPA 904.0	Radium-228	0.544 ± 0.375 (0.718) C:80% T:87%	pCi/L		06/13/16 19:35	
SM 2540C	Total Dissolved Solids	386	mg/L	25.0	05/27/16 17:48	
92299214003	**MW-4**					
EPA 300.0	Chloride	144	mg/L	3.0	06/02/16 06:39	
EPA 300.0	Fluoride	0.42	mg/L	0.10	06/01/16 19:26	
EPA 300.0	Sulfate	3.4	mg/L	1.0	06/01/16 19:26	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299214003	**MW-4**					
EPA 6010	Barium	90.5	ug/L	5.0	05/31/16 19:59	
EPA 6010	Calcium	18600	ug/L	100	05/31/16 19:59	
EPA 6020B	Boron	6.4	ug/L	5.0	06/02/16 13:05	
EPA 6020B	Lithium	15.8	ug/L	0.50	06/02/16 13:05	
EPA 8260	Methylene Chloride	2.3	ug/L	1.0	05/28/16 01:40	B,C9
EPA 903.1	Radium-226	0.295 ± 0.410 (0.684) C:NA T:83%	pCi/L		06/20/16 13:25	
EPA 904.0	Radium-228	0.584 ± 0.409 (0.799) C:83% T:90%	pCi/L		06/13/16 19:36	
SM 2540C	Total Dissolved Solids	486	mg/L	25.0	05/27/16 17:48	
92299214004	**MW-5**					
EPA 300.0	Chloride	19.3	mg/L	1.0	06/01/16 19:47	
EPA 300.0	Fluoride	0.50	mg/L	0.10	06/01/16 19:47	
EPA 300.0	Sulfate	3.4	mg/L	1.0	06/01/16 19:47	
EPA 6010	Barium	100	ug/L	5.0	05/31/16 20:02	
EPA 6010	Calcium	11900	ug/L	100	05/31/16 20:02	
EPA 6020B	Boron	10.7	ug/L	5.0	06/02/16 13:07	
EPA 6020B	Lithium	8.9	ug/L	0.50	06/02/16 13:07	
EPA 903.1	Radium-226	0.0766 ± 0.349 (0.207) C:NA T:83%	pCi/L		06/20/16 13:27	
EPA 904.0	Radium-228	-0.0121 ± 0.330 (0.771) C:79% T:89%	pCi/L		06/13/16 19:36	
SM 2540C	Total Dissolved Solids	229	mg/L	25.0	05/27/16 17:48	
92299214005	**LEACHATE -1**					
EPA 300.0	Chloride	5.2	mg/L	1.0	06/01/16 21:32	
EPA 300.0	Fluoride	0.14	mg/L	0.10	06/01/16 21:32	
EPA 300.0	Sulfate	178	mg/L	4.0	06/02/16 07:07	
EPA 6010	Antimony	6.9	ug/L	5.0	05/31/16 20:05	
EPA 6010	Barium	95.6	ug/L	5.0	05/31/16 20:05	
EPA 6010	Calcium	90000	ug/L	100	05/31/16 20:05	
EPA 6010	Molybdenum	99.5	ug/L	5.0	05/31/16 20:05	
EPA 6010	Selenium	43.8	ug/L	10.0	05/31/16 20:05	
EPA 6010	Vanadium	17.8	ug/L	5.0	05/31/16 20:05	
EPA 6010	Zinc	10.3	ug/L	10.0	05/31/16 20:05	
EPA 6020B	Boron	593	ug/L	25.0	06/02/16 13:25	
EPA 6020B	Lithium	30.1	ug/L	2.5	06/02/16 13:25	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299214005	**LEACHATE -1**					
EPA 903.1	Radium-226	0.214 ± 0.371 (0.663) C:NA T:88%	pCi/L		06/20/16 13:42	
EPA 904.0	Radium-228	0.0701 ± 0.388 (0.885) C:80% T:78%	pCi/L		06/13/16 19:36	
SM 2540C	Total Dissolved Solids	427	mg/L	25.0	05/27/16 17:48	
92299214006	**AMBIENT BLANK**					
EPA 8260	Methylene Chloride	9.7	ug/L	1.0	05/27/16 23:57	B
EPA 903.1	Radium-226	-0.145 ± 0.348 (0.870) C:NA T:83%	pCi/L		06/20/16 13:39	
EPA 904.0	Radium-228	0.647 ± 0.404 (0.756) C:79% T:85%	pCi/L		06/13/16 19:36	
92299214007	**EQ. BLANK**					
EPA 8260	Methylene Chloride	2.2	ug/L	1.0	05/28/16 00:14	B,C9
EPA 903.1	Radium-226	0.686 ± 0.544 (0.708) C:NA T:78%	pCi/L		06/20/16 13:40	
EPA 904.0	Radium-228	0.242 ± 0.361 (0.779) C:82% T:83%	pCi/L		06/13/16 19:36	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: SW-2 **Lab ID: 92299214001** Collected: 05/25/16 10:00 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**14.9**	mg/L	1.0	1		06/01/16 18:01	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		06/01/16 18:01	16984-48-8	
Sulfate	**15.0**	mg/L	1.0	1		06/01/16 18:01	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:47	7440-38-2	
Barium	**81.1**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 19:47	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 19:47	7440-43-9	
Calcium	**10900**	ug/L	100	1	05/27/16 19:05	05/31/16 19:47	7440-70-2	
Chromium	**5.6**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-48-4	
Copper	**6.2**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-50-8	
Lead	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:47	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 19:47	7440-28-0	
Vanadium	**11.0**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:47	7440-62-2	
Zinc	**16.6**	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:47	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**29.3**	ug/L	5.0	1	06/01/16 21:37	06/02/16 12:56	7440-42-8	
Lithium	**3.4**	ug/L	0.50	1	06/01/16 21:37	06/02/16 12:56	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:06	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 01:06	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 01:06	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 01:06	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 01:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 01:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 01:06	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 01:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 01:06	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 01:06	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 01:06	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 01:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 01:06	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 01:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 01:06	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 01:06	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: SW-2 **Lab ID: 92299214001** Collected: 05/25/16 10:00 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/28/16 01:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 01:06	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 01:06	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 01:06	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 01:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 01:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 01:06	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 01:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 01:06	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 01:06	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 01:06	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 01:06	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/28/16 01:06	75-09-2	B,C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 01:06	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 01:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 01:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 01:06	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 01:06	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 01:06	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 01:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 01:06	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 01:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 01:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 01:06	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 01:06	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 01:06	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 01:06	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		05/28/16 01:06	460-00-4	
1,2-Dichloroethane-d4 (S)	112	%	70-130	1		05/28/16 01:06	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		05/28/16 01:06	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**174**	mg/L	25.0	1		05/27/16 17:47		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: SW-1 **Lab ID: 92299214002** Collected: 05/25/16 10:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**16.7**	mg/L	1.0	1		06/01/16 18:22	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		06/01/16 18:22	16984-48-8	
Sulfate	**10.6**	mg/L	1.0	1		06/01/16 18:22	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:55	7440-38-2	
Barium	**177**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 19:55	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 19:55	7440-43-9	
Calcium	**5220**	ug/L	100	1	05/27/16 19:05	05/31/16 19:55	7440-70-2	
Chromium	**7.8**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-48-4	
Copper	**7.9**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-50-8	
Lead	**13.2**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7439-98-7	
Nickel	**5.2**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:55	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 19:55	7440-28-0	
Vanadium	**25.1**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:55	7440-62-2	
Zinc	**25.8**	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:55	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**15.0**	ug/L	5.0	1	06/01/16 21:37	06/02/16 13:02	7440-42-8	
Lithium	**6.8**	ug/L	0.50	1	06/01/16 21:37	06/02/16 13:02	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:09	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 01:23	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 01:23	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 01:23	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 01:23	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 01:23	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 01:23	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 01:23	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 01:23	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 01:23	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 01:23	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 01:23	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 01:23	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 01:23	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 01:23	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 01:23	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: SW-1 **Lab ID: 92299214002** Collected: 05/25/16 10:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/28/16 01:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 01:23	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 01:23	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 01:23	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 01:23	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 01:23	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 01:23	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 01:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 01:23	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 01:23	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 01:23	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 01:23	74-88-4	
Methylene Chloride	**1.1**	ug/L	1.0	1		05/28/16 01:23	75-09-2	B,C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 01:23	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 01:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 01:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 01:23	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 01:23	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 01:23	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 01:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 01:23	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 01:23	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 01:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 01:23	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 01:23	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 01:23	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 01:23	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		05/28/16 01:23	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	70-130	1		05/28/16 01:23	17060-07-0	
Toluene-d8 (S)	95	%	70-130	1		05/28/16 01:23	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**386**	mg/L	25.0	1		05/27/16 17:48		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: MW-4 **Lab ID: 92299214003** Collected: 05/25/16 13:35 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**144**	mg/L	3.0	3		06/02/16 06:39	16887-00-6	
Fluoride	**0.42**	mg/L	0.10	1		06/01/16 19:26	16984-48-8	
Sulfate	**3.4**	mg/L	1.0	1		06/01/16 19:26	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:59	7440-38-2	
Barium	**90.5**	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 19:59	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 19:59	7440-43-9	
Calcium	**18600**	ug/L	100	1	05/27/16 19:05	05/31/16 19:59	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-48-4	
Copper	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-50-8	
Lead	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:59	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 19:59	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 19:59	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 19:59	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.4**	ug/L	5.0	1	06/01/16 21:37	06/02/16 13:05	7440-42-8	
Lithium	**15.8**	ug/L	0.50	1	06/01/16 21:37	06/02/16 13:05	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:11	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 01:40	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 01:40	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 01:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 01:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 01:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 01:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 01:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 01:40	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 01:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 01:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 01:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 01:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 01:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 01:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 01:40	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: MW-4 **Lab ID: 92299214003** Collected: 05/25/16 13:35 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/28/16 01:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 01:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 01:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 01:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 01:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 01:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 01:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 01:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 01:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 01:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 01:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 01:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 01:40	74-88-4	
Methylene Chloride	**2.3**	ug/L	1.0	1		05/28/16 01:40	75-09-2	B,C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 01:40	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 01:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 01:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 01:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 01:40	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 01:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 01:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 01:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 01:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 01:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 01:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 01:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 01:40	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 01:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		05/28/16 01:40	460-00-4	
1,2-Dichloroethane-d4 (S)	117	%	70-130	1		05/28/16 01:40	17060-07-0	
Toluene-d8 (S)	97	%	70-130	1		05/28/16 01:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**486**	mg/L	25.0	1		05/27/16 17:48		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: MW-5 **Lab ID: 92299214004** Collected: 05/25/16 15:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**19.3**	mg/L	1.0	1		06/01/16 19:47	16887-00-6	
Fluoride	**0.50**	mg/L	0.10	1		06/01/16 19:47	16984-48-8	
Sulfate	**3.4**	mg/L	1.0	1		06/01/16 19:47	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:02	7440-38-2	
Barium	**100**	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:02	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:02	7440-43-9	
Calcium	**11900**	ug/L	100	1	05/27/16 19:05	05/31/16 20:02	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-48-4	
Copper	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-50-8	
Lead	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:02	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 20:02	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:02	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:02	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10.7**	ug/L	5.0	1	06/01/16 21:37	06/02/16 13:07	7440-42-8	
Lithium	**8.9**	ug/L	0.50	1	06/01/16 21:37	06/02/16 13:07	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:13	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 02:15	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 02:15	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 02:15	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 02:15	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 02:15	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 02:15	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 02:15	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 02:15	78-93-3	M1
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 02:15	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 02:15	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 02:15	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 02:15	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 02:15	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 02:15	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 02:15	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: MW-5 **Lab ID: 92299214004** Collected: 05/25/16 15:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/28/16 02:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 02:15	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 02:15	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 02:15	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 02:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 02:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 02:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 02:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 02:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 02:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 02:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 02:15	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 02:15	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 02:15	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 02:15	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		05/28/16 02:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 02:15	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 02:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 02:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 02:15	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 02:15	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 02:15	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 02:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 02:15	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 02:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 02:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 02:15	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 02:15	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 02:15	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 02:15	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		05/28/16 02:15	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70-130	1		05/28/16 02:15	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		05/28/16 02:15	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**229**	mg/L	25.0	1		05/27/16 17:48		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: LEACHATE -1 **Lab ID: 92299214005** Collected: 05/25/16 14:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**5.2**	mg/L	1.0	1		06/01/16 21:32	16887-00-6	
Fluoride	**0.14**	mg/L	0.10	1		06/01/16 21:32	16984-48-8	
Sulfate	**178**	mg/L	4.0	4		06/02/16 07:07	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**6.9**	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:05	7440-38-2	
Barium	**95.6**	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:05	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:05	7440-43-9	
Calcium	**90000**	ug/L	100	1	05/27/16 19:05	05/31/16 20:05	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-48-4	
Copper	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-50-8	
Lead	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7439-92-1	
Molybdenum	**99.5**	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-02-0	
Selenium	**43.8**	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:05	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 20:05	7440-28-0	
Vanadium	**17.8**	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:05	7440-62-2	
Zinc	**10.3**	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:05	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**593**	ug/L	25.0	5	06/01/16 21:37	06/02/16 13:25	7440-42-8	
Lithium	**30.1**	ug/L	2.5	5	06/01/16 21:37	06/02/16 13:25	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:16	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 02:33	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 02:33	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 02:33	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 02:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 02:33	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 02:33	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 02:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 02:33	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 02:33	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 02:33	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 02:33	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 02:33	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 02:33	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 02:33	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 02:33	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: LEACHATE -1 **Lab ID: 92299214005** Collected: 05/25/16 14:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/28/16 02:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 02:33	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 02:33	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 02:33	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 02:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 02:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 02:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 02:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 02:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 02:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 02:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 02:33	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 02:33	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 02:33	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 02:33	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/28/16 02:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 02:33	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 02:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 02:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 02:33	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 02:33	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 02:33	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 02:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 02:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 02:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 02:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 02:33	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 02:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 02:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 02:33	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		05/28/16 02:33	460-00-4	
1,2-Dichloroethane-d4 (S)	110	%	70-130	1		05/28/16 02:33	17060-07-0	
Toluene-d8 (S)	97	%	70-130	1		05/28/16 02:33	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**427**	mg/L	25.0	1		05/27/16 17:48		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: AMBIENT BLANK **Lab ID: 92299214006** Collected: 05/25/16 11:40 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		06/01/16 21:53	16887-00-6	
Fluoride	ND	mg/L	0.10	1		06/01/16 21:53	16984-48-8	
Sulfate	ND	mg/L	1.0	1		06/01/16 21:53	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:08	7440-38-2	
Barium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:08	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:08	7440-43-9	
Calcium	ND	ug/L	100	1	05/27/16 19:05	05/31/16 20:08	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-48-4	
Copper	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-50-8	
Lead	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:08	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 20:08	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:08	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:08	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	06/01/16 21:37	06/02/16 13:40	7440-42-8	
Lithium	ND	ug/L	0.50	1	06/01/16 21:37	06/02/16 13:40	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:18	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/27/16 23:57	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/27/16 23:57	107-13-1	
Benzene	ND	ug/L	1.0	1		05/27/16 23:57	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/27/16 23:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/27/16 23:57	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/27/16 23:57	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/27/16 23:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/27/16 23:57	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/27/16 23:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/27/16 23:57	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/27/16 23:57	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/27/16 23:57	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/27/16 23:57	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/27/16 23:57	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/27/16 23:57	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: AMBIENT BLANK **Lab ID: 92299214006** Collected: 05/25/16 11:40 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/27/16 23:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/27/16 23:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/27/16 23:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/27/16 23:57	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/27/16 23:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/27/16 23:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/27/16 23:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/27/16 23:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/27/16 23:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/27/16 23:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/27/16 23:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/27/16 23:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/27/16 23:57	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/27/16 23:57	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/27/16 23:57	74-88-4	
Methylene Chloride	**9.7**	ug/L	1.0	1		05/27/16 23:57	75-09-2	B
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/27/16 23:57	108-10-1	
Styrene	ND	ug/L	1.0	1		05/27/16 23:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/27/16 23:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/27/16 23:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/27/16 23:57	127-18-4	
Toluene	ND	ug/L	1.0	1		05/27/16 23:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/27/16 23:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/27/16 23:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/27/16 23:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/27/16 23:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/27/16 23:57	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/27/16 23:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/27/16 23:57	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/27/16 23:57	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		05/27/16 23:57	460-00-4	
1,2-Dichloroethane-d4 (S)	112	%	70-130	1		05/27/16 23:57	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		05/27/16 23:57	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		05/31/16 10:06		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: EQ. BLANK **Lab ID: 92299214007** Collected: 05/25/16 12:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		06/01/16 22:14	16887-00-6	
Fluoride	ND	mg/L	0.10	1		06/01/16 22:14	16984-48-8	
Sulfate	ND	mg/L	1.0	1		06/01/16 22:14	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:11	7440-38-2	
Barium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:11	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/27/16 19:05	05/31/16 20:11	7440-43-9	
Calcium	ND	ug/L	100	1	05/27/16 19:05	05/31/16 20:11	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-48-4	
Copper	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-50-8	
Lead	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:11	7782-49-2	
Silver	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/27/16 19:05	05/31/16 20:11	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/27/16 19:05	05/31/16 20:11	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/27/16 19:05	05/31/16 20:11	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	06/01/16 21:37	06/02/16 13:43	7440-42-8	
Lithium	ND	ug/L	0.50	1	06/01/16 21:37	06/02/16 13:43	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/27/16 11:00	05/31/16 10:21	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 00:14	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 00:14	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 00:14	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 00:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 00:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 00:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 00:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 00:14	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 00:14	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 00:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 00:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 00:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 00:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 00:14	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 00:14	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: EQ. BLANK **Lab ID: 92299214007** Collected: 05/25/16 12:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/28/16 00:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 00:14	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 00:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 00:14	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 00:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 00:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 00:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 00:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 00:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 00:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 00:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 00:14	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 00:14	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 00:14	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 00:14	74-88-4	
Methylene Chloride	**2.2**	ug/L	1.0	1		05/28/16 00:14	75-09-2	B,C9
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 00:14	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 00:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 00:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 00:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 00:14	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 00:14	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 00:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 00:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 00:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 00:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 00:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 00:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 00:14	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 00:14	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	108	%	70-130	1		05/28/16 00:14	460-00-4	
1,2-Dichloroethane-d4 (S)	114	%	70-130	1		05/28/16 00:14	17060-07-0	
Toluene-d8 (S)	97	%	70-130	1		05/28/16 00:14	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		05/31/16 10:07		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: TRIP BLANK **Lab ID: 92299214008** Collected: 05/25/16 07:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/28/16 00:31	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		05/28/16 00:31	107-13-1	
Benzene	ND	ug/L	1.0	1		05/28/16 00:31	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/28/16 00:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/28/16 00:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/28/16 00:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/28/16 00:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/28/16 00:31	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		05/28/16 00:31	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/28/16 00:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/28/16 00:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/28/16 00:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/28/16 00:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/28/16 00:31	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/28/16 00:31	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		05/28/16 00:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 00:31	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/28/16 00:31	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/28/16 00:31	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/28/16 00:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/28/16 00:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/28/16 00:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 00:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/28/16 00:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/28/16 00:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 00:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/28/16 00:31	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/28/16 00:31	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/28/16 00:31	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/28/16 00:31	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/28/16 00:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/28/16 00:31	108-10-1	
Styrene	ND	ug/L	1.0	1		05/28/16 00:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 00:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/28/16 00:31	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/28/16 00:31	127-18-4	
Toluene	ND	ug/L	1.0	1		05/28/16 00:31	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/28/16 00:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/28/16 00:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/28/16 00:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/28/16 00:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/28/16 00:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/28/16 00:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/28/16 00:31	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/28/16 00:31	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		05/28/16 00:31	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: TRIP BLANK **Lab ID: 92299214008** Collected: 05/25/16 07:30 Received: 05/26/16 14:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	111	%	70-130	1		05/28/16 00:31	17060-07-0	
Toluene-d8 (S)	96	%	70-130	1		05/28/16 00:31	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: GWD/3184 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004

METHOD BLANK: 1745717 Matrix: Water
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	06/01/16 10:19	
Fluoride	mg/L	ND	0.10	06/01/16 10:19	
Sulfate	mg/L	ND	1.0	06/01/16 10:19	

LABORATORY CONTROL SAMPLE: 1745718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.4	101	90-110	
Fluoride	mg/L	2.5	2.7	107	90-110	
Sulfate	mg/L	50	49.6	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745719 1745720

Parameter	Units	92298827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.1	50	50	53.8	54.5	103	105	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	100	102	90-110	2	20	
Sulfate	mg/L	1.8	50	50	53.3	53.8	103	104	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745721 1745722

Parameter	Units	92299214004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	19.3	50	50	71.1	71.0	104	103	90-110	0	20	
Fluoride	mg/L	0.50	2.5	2.5	3.0	3.0	100	99	90-110	0	20	
Sulfate	mg/L	3.4	50	50	54.7	54.7	102	103	90-110	0	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: GWD/3185 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92299214005, 92299214006, 92299214007

METHOD BLANK: 1745725 | Matrix: Water
Associated Lab Samples: 92299214005, 92299214006, 92299214007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	06/01/16 20:50	
Fluoride	mg/L	ND	0.10	06/01/16 20:50	
Sulfate	mg/L	ND	1.0	06/01/16 20:50	

LABORATORY CONTROL SAMPLE: 1745726

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.5	101	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	50	49.0	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745729 1745730

Parameter	Units	92299356004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	396	50	50	414	411	34	29	90-110	1	20	M6
Fluoride	mg/L	ND	2.5	2.5	2.4	2.3	92	91	90-110	1	20	
Sulfate	mg/L	6.0	50	50	56.3	56.4	101	101	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746364 1746365

Parameter	Units	92298833012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.2	50	50	52.7	54.0	101	104	90-110	2	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.5	95	98	90-110	3	20	
Sulfate	mg/L	2.4	50	50	52.3	53.6	100	102	90-110	2	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: MERP/9501 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

METHOD BLANK: 1743711 Matrix: Water
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	05/31/16 09:38	

LABORATORY CONTROL SAMPLE: 1743712

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1743713 1743714

Parameter	Units	92299075001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.5	2.5	100	101	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: MPRP/21864 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

METHOD BLANK: 1744180 Matrix: Water
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	05/31/16 19:32	
Arsenic	ug/L	ND	10.0	05/31/16 19:32	
Barium	ug/L	ND	5.0	05/31/16 19:32	
Beryllium	ug/L	ND	1.0	05/31/16 19:32	
Cadmium	ug/L	ND	1.0	05/31/16 19:32	
Calcium	ug/L	ND	100	05/31/16 19:32	
Chromium	ug/L	ND	5.0	05/31/16 19:32	
Cobalt	ug/L	ND	5.0	05/31/16 19:32	
Copper	ug/L	ND	5.0	05/31/16 19:32	
Lead	ug/L	ND	5.0	05/31/16 19:32	
Molybdenum	ug/L	ND	5.0	05/31/16 19:32	
Nickel	ug/L	ND	5.0	05/31/16 19:32	
Selenium	ug/L	ND	10.0	05/31/16 19:32	
Silver	ug/L	ND	5.0	05/31/16 19:32	
Thallium	ug/L	ND	5.4	05/31/16 19:32	
Vanadium	ug/L	ND	5.0	05/31/16 19:32	
Zinc	ug/L	ND	10.0	05/31/16 19:32	

LABORATORY CONTROL SAMPLE: 1744181

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	471	94	80-120	
Arsenic	ug/L	500	464	93	80-120	
Barium	ug/L	500	488	98	80-120	
Beryllium	ug/L	500	468	94	80-120	
Cadmium	ug/L	500	480	96	80-120	
Calcium	ug/L	5000	4850	97	80-120	
Chromium	ug/L	500	480	96	80-120	
Cobalt	ug/L	500	470	94	80-120	
Copper	ug/L	500	488	98	80-120	
Lead	ug/L	500	470	94	80-120	
Molybdenum	ug/L	500	501	100	80-120	
Nickel	ug/L	500	478	96	80-120	
Selenium	ug/L	500	467	93	80-120	
Silver	ug/L	250	239	96	80-120	
Thallium	ug/L	500	462	92	80-120	
Vanadium	ug/L	500	476	95	80-120	
Zinc	ug/L	500	471	94	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744182 1744183

Parameter	Units	92299214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	451	445	90	89	75-125	1	25	
Arsenic	ug/L	ND	500	500	465	460	93	92	75-125	1	25	
Barium	ug/L	81.1	500	500	577	570	99	98	75-125	1	25	
Beryllium	ug/L	ND	500	500	466	461	93	92	75-125	1	25	
Cadmium	ug/L	ND	500	500	477	471	95	94	75-125	1	25	
Calcium	ug/L	10900	5000	5000	15400	15400	91	91	75-125	0	25	
Chromium	ug/L	5.6	500	500	478	476	94	94	75-125	0	25	
Cobalt	ug/L	ND	500	500	468	462	93	92	75-125	1	25	
Copper	ug/L	6.2	500	500	495	486	98	96	75-125	2	25	
Lead	ug/L	ND	500	500	468	466	93	92	75-125	1	25	
Molybdenum	ug/L	ND	500	500	499	492	100	98	75-125	1	25	
Nickel	ug/L	ND	500	500	475	468	94	93	75-125	1	25	
Selenium	ug/L	ND	500	500	459	457	91	91	75-125	0	25	
Silver	ug/L	ND	250	250	237	235	94	94	75-125	1	25	
Thallium	ug/L	ND	500	500	468	462	93	92	75-125	1	25	
Vanadium	ug/L	11.0	500	500	483	480	94	94	75-125	1	25	
Zinc	ug/L	16.6	500	500	481	478	93	92	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: MPRP/63924 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

METHOD BLANK: 2273802 Matrix: Water
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	06/02/16 12:46	
Lithium	ug/L	ND	0.50	06/02/16 12:46	

LABORATORY CONTROL SAMPLE: 2273803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	94.4	94	80-120	
Lithium	ug/L	100	101	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2273804 2273805

Parameter	Units	92299214001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	29.3	100	100	124	120	95	90	75-125	4	20	
Lithium	ug/L	3.4	100	100	104	103	101	100	75-125	1	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: MSV/37030 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007, 92299214008

METHOD BLANK: 1743932 Matrix: Water
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007, 92299214008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/27/16 23:22	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/27/16 23:22	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/27/16 23:22	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/27/16 23:22	
1,1-Dichloroethane	ug/L	ND	1.0	05/27/16 23:22	
1,1-Dichloroethene	ug/L	ND	1.0	05/27/16 23:22	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/27/16 23:22	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/27/16 23:22	
1,2-Dichloroethane	ug/L	ND	1.0	05/27/16 23:22	
1,2-Dichloropropane	ug/L	ND	1.0	05/27/16 23:22	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/27/16 23:22	
2-Butanone (MEK)	ug/L	ND	5.0	05/27/16 23:22	
2-Hexanone	ug/L	ND	5.0	05/27/16 23:22	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/27/16 23:22	
Acetone	ug/L	ND	25.0	05/27/16 23:22	
Acrylonitrile	ug/L	ND	10.0	05/27/16 23:22	
Benzene	ug/L	ND	1.0	05/27/16 23:22	
Bromochloromethane	ug/L	ND	1.0	05/27/16 23:22	
Bromodichloromethane	ug/L	ND	1.0	05/27/16 23:22	
Bromoform	ug/L	ND	1.0	05/27/16 23:22	
Bromomethane	ug/L	ND	2.0	05/27/16 23:22	
Carbon disulfide	ug/L	ND	2.0	05/27/16 23:22	
Carbon tetrachloride	ug/L	ND	1.0	05/27/16 23:22	
Chlorobenzene	ug/L	ND	1.0	05/27/16 23:22	
Chloroethane	ug/L	ND	1.0	05/27/16 23:22	
Chloroform	ug/L	ND	1.0	05/27/16 23:22	
Chloromethane	ug/L	ND	1.0	05/27/16 23:22	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/27/16 23:22	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/27/16 23:22	
Dibromochloromethane	ug/L	ND	1.0	05/27/16 23:22	
Dibromomethane	ug/L	ND	1.0	05/27/16 23:22	
Ethylbenzene	ug/L	ND	1.0	05/27/16 23:22	
Iodomethane	ug/L	ND	5.0	05/27/16 23:22	
Methylene Chloride	ug/L	1.8	1.0	05/27/16 23:22	C9
Styrene	ug/L	ND	1.0	05/27/16 23:22	
Tetrachloroethene	ug/L	ND	1.0	05/27/16 23:22	
Toluene	ug/L	ND	1.0	05/27/16 23:22	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/27/16 23:22	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/27/16 23:22	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	05/27/16 23:22	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

METHOD BLANK: 1743932 Matrix: Water

Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007, 92299214008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	05/27/16 23:22	
Trichlorofluoromethane	ug/L	ND	1.0	05/27/16 23:22	
Vinyl acetate	ug/L	ND	2.0	05/27/16 23:22	
Vinyl chloride	ug/L	ND	1.0	05/27/16 23:22	
Xylene (Total)	ug/L	ND	2.0	05/27/16 23:22	
1,2-Dichloroethane-d4 (S)	%	111	70-130	05/27/16 23:22	
4-Bromofluorobenzene (S)	%	99	70-130	05/27/16 23:22	
Toluene-d8 (S)	%	97	70-130	05/27/16 23:22	

LABORATORY CONTROL SAMPLE: 1743933

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.9	98	80-125	
1,1,1-Trichloroethane	ug/L	50	49.2	98	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	55.1	110	79-124	
1,1,2-Trichloroethane	ug/L	50	53.7	107	85-125	
1,1-Dichloroethane	ug/L	50	49.5	99	73-126	
1,1-Dichloroethene	ug/L	50	54.9	110	66-135	
1,2,3-Trichloropropane	ug/L	50	53.7	107	75-130	
1,2-Dichlorobenzene	ug/L	50	56.3	113	80-133	
1,2-Dichloroethane	ug/L	50	51.3	103	67-128	
1,2-Dichloropropane	ug/L	50	50.9	102	75-132	
1,4-Dichlorobenzene	ug/L	50	56.5	113	78-130	
2-Butanone (MEK)	ug/L	100	127	127	61-144	
2-Hexanone	ug/L	100	123	123	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	114	114	72-135	
Acetone	ug/L	100	111	111	48-146	
Acrylonitrile	ug/L	250	288	115	40-160	
Benzene	ug/L	50	50.3	101	80-125	
Bromochloromethane	ug/L	50	49.7	99	71-125	
Bromodichloromethane	ug/L	50	47.9	96	78-124	
Bromoform	ug/L	50	48.6	97	71-128	
Bromomethane	ug/L	50	34.2	68	40-160	
Carbon disulfide	ug/L	50	55.5	111	50-160	
Carbon tetrachloride	ug/L	50	45.7	91	69-131	
Chlorobenzene	ug/L	50	52.5	105	81-122	
Chloroethane	ug/L	50	42.4	85	39-148	
Chloroform	ug/L	50	51.3	103	73-127	
Chloromethane	ug/L	50	44.9	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	54.6	109	74-124	
cis-1,3-Dichloropropene	ug/L	50	49.6	99	72-132	
Dibromochloromethane	ug/L	50	49.9	100	78-125	
Dibromomethane	ug/L	50	48.7	97	82-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

LABORATORY CONTROL SAMPLE: 1743933

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	47.6	95	79-121	
Iodomethane	ug/L	100	80.9	81	39-154	
Methylene Chloride	ug/L	50	50.2	100	64-133	
Styrene	ug/L	50	53.4	107	84-126	
Tetrachloroethene	ug/L	50	41.5	83	78-122	
Toluene	ug/L	50	48.6	97	80-121	
trans-1,2-Dichloroethene	ug/L	50	53.1	106	71-127	
trans-1,3-Dichloropropene	ug/L	50	47.0	94	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	49.4	99	40-160	
Trichloroethene	ug/L	50	45.5	91	78-122	
Trichlorofluoromethane	ug/L	50	43.8	88	53-137	
Vinyl acetate	ug/L	100	108	108	40-160	
Vinyl chloride	ug/L	50	56.5	113	58-137	
Xylene (Total)	ug/L	150	144	96	81-126	
1,2-Dichloroethane-d4 (S)	%			110	70-130	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1743935

Parameter	Units	92299214004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.5	102	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.0	110	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	22.8	114	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	20.5	102	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.7	114	70-130	
1,1-Dichloroethene	ug/L	ND	20	19.7	99	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	22.7	113	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.5	107	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.8	109	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.6	108	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.9	109	70-130	
2-Butanone (MEK)	ug/L	ND	40	57.6	144	70-130	M1
2-Hexanone	ug/L	ND	40	51.5	129	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	43.5	109	70-130	
Acetone	ug/L	ND	40	44.9	112	70-130	
Acrylonitrile	ug/L	ND	100	130	130	70-130	
Benzene	ug/L	ND	20	21.0	105	70-148	
Bromochloromethane	ug/L	ND	20	23.9	120	70-130	
Bromodichloromethane	ug/L	ND	20	18.3	91	70-130	
Bromoform	ug/L	ND	20	18.9	94	70-130	
Bromomethane	ug/L	ND	20	14.4	72	70-130	
Carbon disulfide	ug/L	ND	20	21.4	107	70-130	
Carbon tetrachloride	ug/L	ND	20	18.4	92	70-130	
Chlorobenzene	ug/L	ND	20	21.8	109	70-146	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

MATRIX SPIKE SAMPLE: 1743935

Parameter	Units	92299214004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	17.9	90	70-130	
Chloroform	ug/L	ND	20	22.6	113	70-130	
Chloromethane	ug/L	ND	20	20.0	100	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.8	119	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.6	98	70-130	
Dibromochloromethane	ug/L	ND	20	21.0	105	70-130	
Dibromomethane	ug/L	ND	20	20.4	102	70-130	
Ethylbenzene	ug/L	ND	20	20.2	101	70-130	
Iodomethane	ug/L	ND	40	27.2	68	70-130	M1
Methylene Chloride	ug/L	ND	20	19.9	100	70-130	
Styrene	ug/L	ND	20	22.5	112	70-130	
Tetrachloroethene	ug/L	ND	20	17.2	86	70-130	
Toluene	ug/L	ND	20	19.2	96	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	19.8	99	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.2	91	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	18.9	95	70-130	
Trichloroethene	ug/L	ND	20	17.9	90	69-151	
Trichlorofluoromethane	ug/L	ND	20	18.1	91	70-130	
Vinyl acetate	ug/L	ND	40	41.3	103	70-130	
Vinyl chloride	ug/L	ND	20	25.2	126	70-130	
1,2-Dichloroethane-d4 (S)	%				115	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				94	70-130	

SAMPLE DUPLICATE: 1743934

Parameter	Units	92299214003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

SAMPLE DUPLICATE: 1743934

Parameter	Units	92299214003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	2.3	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	117	116	1		
4-Bromofluorobenzene (S)	%	106	101	5		
Toluene-d8 (S)	%	97	97	0		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: WET/45215 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005

METHOD BLANK: 1744347 Matrix: Water
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	05/27/16 17:42	

LABORATORY CONTROL SAMPLE: 1744348

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	242	97	90-110	

SAMPLE DUPLICATE: 1744349

Parameter	Units	92299071001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	249	254	2	5	

SAMPLE DUPLICATE: 1744350

Parameter	Units	92299077003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	221	215	3	5	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: WET/45229 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92299214006, 92299214007

METHOD BLANK: 1745014 | Matrix: Water
Associated Lab Samples: 92299214006, 92299214007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	05/31/16 10:04	

LABORATORY CONTROL SAMPLE: 1745015

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	246	98	90-110	

SAMPLE DUPLICATE: 1745016

Parameter	Units	92298723017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	241000 ug/L	233	3	5	

SAMPLE DUPLICATE: 1745017

Parameter	Units	92299275010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	726	725	0	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: SW-2 **Lab ID: 92299214001** Collected: 05/25/16 10:00 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.141 ± 0.322 (0.191)** **C:NA T:86%**	pCi/L	06/20/16 13:27	13982-63-3	
Radium-228	EPA 904.0	**0.703 ± 0.459 (0.873)** **C:80% T:78%**	pCi/L	06/13/16 19:35	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: SW-1 **Lab ID: 92299214002** Collected: 05/25/16 10:30 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.536 ± 1.29 (2.49)** **C:NA T:24%**	pCi/L	06/20/16 13:53	13982-63-3	
Radium-228	EPA 904.0	**0.544 ± 0.375 (0.718)** **C:80% T:87%**	pCi/L	06/13/16 19:35	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: MW-4 **Lab ID: 92299214003** Collected: 05/25/16 13:35 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.295 ± 0.410 (0.684)** **C:NA T:83%**	pCi/L	06/20/16 13:25	13982-63-3	
Radium-228	EPA 904.0	**0.584 ± 0.409 (0.799)** **C:83% T:90%**	pCi/L	06/13/16 19:36	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: MW-5 **Lab ID: 92299214004** Collected: 05/25/16 15:30 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0766 ± 0.349 (0.207)** **C:NA T:83%**	pCi/L	06/20/16 13:27	13982-63-3	
Radium-228	EPA 904.0	**-0.0121 ± 0.330 (0.771)** **C:79% T:89%**	pCi/L	06/13/16 19:36	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: LEACHATE -1 **Lab ID: 92299214005** Collected: 05/25/16 14:30 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.214 ± 0.371 (0.663)** **C:NA T:88%**	pCi/L	06/20/16 13:42	13982-63-3	
Radium-228	EPA 904.0	**0.0701 ± 0.388 (0.885)** **C:80% T:78%**	pCi/L	06/13/16 19:36	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: AMBIENT BLANK **Lab ID: 92299214006** Collected: 05/25/16 11:40 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.145 ± 0.348 (0.870) C:NA T:83%**	pCi/L	06/20/16 13:39	13982-63-3	
Radium-228	EPA 904.0	**0.647 ± 0.404 (0.756) C:79% T:85%**	pCi/L	06/13/16 19:36	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Sample: EQ. BLANK **Lab ID: 92299214007** Collected: 05/25/16 12:30 Received: 05/26/16 14:50 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.686 ± 0.544 (0.708) C:NA T:78%**	pCi/L	06/20/16 13:40	13982-63-3	
Radium-228	EPA 904.0	**0.242 ± 0.361 (0.779) C:82% T:83%**	pCi/L	06/13/16 19:36	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: RADC/29736 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

METHOD BLANK: 1085050 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.313 (0.638) C:NA T:87%	pCi/L	06/20/16 13:15	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

QC Batch: RADC/29820 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92299214001, 92299214002, 92299214003, 92299214004, 92299214005, 92299214006, 92299214007

METHOD BLANK: 1088745 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.554 ± 0.425 (0.838) C:82% T:77%	pCi/L	06/13/16 19:33	

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
C9	Common Laboratory Contaminant.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299214001	**SW-2**	EPA 300.0	GWD/3184		
92299214002	**SW-1**	EPA 300.0	GWD/3184		
92299214003	**MW-4**	EPA 300.0	GWD/3184		
92299214004	**MW-5**	EPA 300.0	GWD/3184		
92299214005	**LEACHATE -1**	EPA 300.0	GWD/3185		
92299214006	**AMBIENT BLANK**	EPA 300.0	GWD/3185		
92299214007	**EQ. BLANK**	EPA 300.0	GWD/3185		
92299214001	**SW-2**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214002	**SW-1**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214003	**MW-4**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214004	**MW-5**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214005	**LEACHATE -1**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214006	**AMBIENT BLANK**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214007	**EQ. BLANK**	EPA 3010A	MPRP/21864	EPA 6010	ICP/19597
92299214001	**SW-2**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214002	**SW-1**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214003	**MW-4**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214004	**MW-5**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214005	**LEACHATE -1**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214006	**AMBIENT BLANK**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214007	**EQ. BLANK**	EPA 3020	MPRP/63924	EPA 6020B	ICPM/29801
92299214001	**SW-2**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214002	**SW-1**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214003	**MW-4**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214004	**MW-5**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214005	**LEACHATE -1**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214006	**AMBIENT BLANK**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214007	**EQ. BLANK**	EPA 7470	MERP/9501	EPA 7470	MERC/9137
92299214001	**SW-2**	EPA 8260	MSV/37030		
92299214002	**SW-1**	EPA 8260	MSV/37030		
92299214003	**MW-4**	EPA 8260	MSV/37030		
92299214004	**MW-5**	EPA 8260	MSV/37030		
92299214005	**LEACHATE -1**	EPA 8260	MSV/37030		
92299214006	**AMBIENT BLANK**	EPA 8260	MSV/37030		
92299214007	**EQ. BLANK**	EPA 8260	MSV/37030		
92299214008	**TRIP BLANK**	EPA 8260	MSV/37030		
92299214001	**SW-2**	EPA 903.1	RADC/29736		
92299214002	**SW-1**	EPA 903.1	RADC/29736		
92299214003	**MW-4**	EPA 903.1	RADC/29736		
92299214004	**MW-5**	EPA 903.1	RADC/29736		
92299214005	**LEACHATE -1**	EPA 903.1	RADC/29736		
92299214006	**AMBIENT BLANK**	EPA 903.1	RADC/29736		
92299214007	**EQ. BLANK**	EPA 903.1	RADC/29736		
92299214001	**SW-2**	EPA 904.0	RADC/29820		
92299214002	**SW-1**	EPA 904.0	RADC/29820		

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(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299214

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299214003	**MW-4**	EPA 904.0	RADC/29820		
92299214004	**MW-5**	EPA 904.0	RADC/29820		
92299214005	**LEACHATE -1**	EPA 904.0	RADC/29820		
92299214006	**AMBIENT BLANK**	EPA 904.0	RADC/29820		
92299214007	**EQ. BLANK**	EPA 904.0	RADC/29820		
92299214001	**SW-2**	SM 2540C	WET/45215		
92299214002	**SW-1**	SM 2540C	WET/45215		
92299214003	**MW-4**	SM 2540C	WET/45215		
92299214004	**MW-5**	SM 2540C	WET/45215		
92299214005	**LEACHATE -1**	SM 2540C	WET/45215		
92299214006	**AMBIENT BLANK**	SM 2540C	WET/45229		
92299214007	**EQ. BLANK**	SM 2540C	WET/45229		

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Sample Condition Upon Receipt

Client Name: Marrah-Brickhaven

Proj WO#: 92299214

92299214

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☑ Yes ☐ No

Date/Initials Person Examining Contents: 5-26-16

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____

Thermometer: T1505 **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 1.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNO3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	☐ Yes	☐ No	☑ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	12.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	13.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):____				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: JJ **Date:** 5/26/16

Project Manager SRF Review: JJ **Date:** 5/27/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2043529

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Charrah -	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- ☐ NPDES
- ☑ GROUND WATER
- ☐ DRINKING WATER
- ☐ UST
- ☐ RCRA
- ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	RAD.	Metals	8260	TDS	Fluoride	Chloride/sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SW-2		G			5/25/16	1000		11										3	2	3	1	1	1		001
2	SW-1		G			5/25/16	1030		11										3	2	3	1	1	1		002
3	MW-4		G			5/25/16	1335		11										3	2	3	1	1	1		003
4	MW-5		G			5/25/16	1530		11										3	2	3	1	1	1		004
5	Leachate-1		G			5/25/16	1430		11										3	2	3	1	1	1		005
6	Trip Blank		G			5/25/16	0730		2												2					008
7	Ambient Blank		G			5/25/16	1140		11										3	2	3	1	1	1		006
8	Eq. Blank		G			5/25/16	1230		11										3	2	3	1	1	1		007
9																										
10																										
11																										
12																										

9229914

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	05/25/16	1736	Kenneth Pace HU	5-26-16	1450	12	Y	N	Y
	Chet Fort Pace	5/26/16	10:23	Chet Fort Pace	5/26/16	1450	5			

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 05/25/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 21, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on May 27, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92299356001	**BG-1**	Water	05/26/16 10:00	05/27/16 14:16
92299356002	**MW-6**	Water	05/26/16 12:40	05/27/16 14:16
92299356003	**MW-7**	Water	05/26/16 13:55	05/27/16 14:16
92299356004	**MW-8**	Water	05/26/16 15:25	05/27/16 14:16
92299356005	**AMBIENT BLANK**	Water	05/26/16 10:15	05/27/16 14:16
92299356006	**EQ BLANK**	Water	05/26/16 13:00	05/27/16 14:16
92299356007	**TRIP BLANK**	Water	05/26/16 08:00	05/27/16 14:16

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92299356001	**BG-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299356002	**MW-6**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299356003	**MW-7**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299356004	**MW-8**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF, SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299356005	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299356006	**EQ BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	CDF	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299356007	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299356001	**BG-1**					
EPA 300.0	Chloride	250	mg/L	6.0	06/02/16 07:35	
EPA 300.0	Fluoride	0.12	mg/L	0.10	06/01/16 22:35	
EPA 300.0	Sulfate	19.3	mg/L	1.0	06/01/16 22:35	
EPA 6010	Barium	330	ug/L	5.0	06/01/16 20:30	
EPA 6010	Calcium	29500	ug/L	100	06/01/16 20:30	
EPA 6020B	Boron	6.1	ug/L	5.0	06/06/16 11:19	
EPA 6020B	Lithium	23.5	ug/L	0.50	06/06/16 11:19	
EPA 903.1	Radium-226	0.654 ± 0.518 (0.704) C:NA T:95%	pCi/L		06/20/16 22:33	
EPA 904.0	Radium-228	0.0108 ± 0.325 (0.752) C:74% T:90%	pCi/L		06/17/16 16:06	
SM 2540C	Total Dissolved Solids	633	mg/L	25.0	05/31/16 17:21	
92299356002	**MW-6**					
EPA 300.0	Chloride	243	mg/L	5.0	06/02/16 08:02	
EPA 300.0	Fluoride	0.46	mg/L	0.10	06/01/16 23:38	
EPA 300.0	Sulfate	51.6	mg/L	1.0	06/01/16 23:38	
EPA 6010	Barium	88.3	ug/L	5.0	06/01/16 20:49	
EPA 6010	Calcium	33200	ug/L	100	06/01/16 20:49	
EPA 6020B	Boron	6.1	ug/L	5.0	06/06/16 10:52	
EPA 6020B	Lithium	30.6	ug/L	0.50	06/06/16 10:52	
EPA 903.1	Radium-226	-0.075 ± 0.471 (0.953) C:NA T:84%	pCi/L		06/20/16 22:58	
EPA 904.0	Radium-228	0.148 ± 0.298 (0.658) C:73% T:95%	pCi/L		06/17/16 16:06	
SM 2540C	Total Dissolved Solids	659	mg/L	25.0	05/31/16 17:21	
92299356003	**MW-7**					
EPA 300.0	Chloride	327	mg/L	8.0	06/02/16 08:29	
EPA 300.0	Fluoride	0.22	mg/L	0.10	06/01/16 23:59	
EPA 300.0	Sulfate	19.1	mg/L	1.0	06/01/16 23:59	
EPA 6010	Barium	222	ug/L	5.0	06/01/16 20:52	
EPA 6010	Calcium	51200	ug/L	100	06/01/16 20:52	
EPA 6020B	Boron	21.2	ug/L	5.0	06/06/16 10:45	
EPA 6020B	Lithium	21.5	ug/L	0.50	06/06/16 10:45	
EPA 903.1	Radium-226	0.0643 ± 0.333 (0.692) C:NA T:95%	pCi/L		06/20/16 23:10	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299356003	**MW-7**					
EPA 904.0	Radium-228	0.126 ± 0.379 (0.849) C:77% T:84%	pCi/L		06/17/16 16:06	
SM 2540C	Total Dissolved Solids	956	mg/L	50.0	05/31/16 17:22	
92299356004	**MW-8**					
EPA 300.0	Chloride	396	mg/L	11.0	06/02/16 08:56	M6
EPA 300.0	Sulfate	6.0	mg/L	1.0	06/02/16 00:20	
EPA 6010	Antimony	7.5	ug/L	5.0	06/01/16 20:55	
EPA 6010	Barium	1260	ug/L	5.0	06/01/16 20:55	
EPA 6010	Calcium	144000	ug/L	500	06/02/16 12:21	
EPA 6020B	Boron	9.3	ug/L	5.0	06/06/16 10:47	
EPA 6020B	Lithium	29.7	ug/L	0.50	06/06/16 10:47	
EPA 903.1	Radium-226	0.719 ± 0.657 (0.953) C:NA T:91%	pCi/L		06/20/16 22:32	
EPA 904.0	Radium-228	0.521 ± 0.373 (0.723) C:79% T:83%	pCi/L		06/17/16 16:07	
SM 2540C	Total Dissolved Solids	1530	mg/L	250	05/31/16 17:22	
92299356005	**AMBIENT BLANK**					
EPA 903.1	Radium-226	0.0348 ± 0.496 (0.938) C:NA T:89%	pCi/L		06/20/16 23:04	
EPA 904.0	Radium-228	-0.123 ± 0.302 (0.730) C:77% T:89%	pCi/L		06/17/16 16:07	
92299356006	**EQ BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.380 (0.852) C:NA T:82%	pCi/L		06/20/16 22:57	
EPA 904.0	Radium-228	-0.0694 ± 0.282 (0.679) C:77% T:84%	pCi/L		06/17/16 16:07	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: BG-1 **Lab ID: 92299356001** Collected: 05/26/16 10:00 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**250**	mg/L	6.0	6		06/02/16 07:35	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		06/01/16 22:35	16984-48-8	
Sulfate	**19.3**	mg/L	1.0	1		06/01/16 22:35	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:30	7440-38-2	
Barium	**330**	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:30	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:30	7440-43-9	
Calcium	**29500**	ug/L	100	1	05/31/16 18:05	06/01/16 20:30	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-48-4	
Copper	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-50-8	
Lead	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:30	7782-49-2	
Silver	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/31/16 18:05	06/01/16 20:30	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:30	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:30	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.1**	ug/L	5.0	1	06/03/16 08:54	06/06/16 11:19	7440-42-8	
Lithium	**23.5**	ug/L	0.50	1	06/03/16 08:54	06/06/16 11:19	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/31/16 15:40	06/02/16 09:17	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 18:21	67-64-1	L3
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 18:21	107-13-1	
Benzene	ND	ug/L	1.0	1		05/30/16 18:21	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 18:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 18:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/30/16 18:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 18:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 18:21	78-93-3	L3
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 18:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 18:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 18:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 18:21	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/30/16 18:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/30/16 18:21	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 18:21	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: BG-1 **Lab ID: 92299356001** Collected: 05/26/16 10:00 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/30/16 18:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 18:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 18:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 18:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 18:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 18:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 18:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 18:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 18:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 18:21	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 18:21	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/30/16 18:21	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 18:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 18:21	108-10-1	
Styrene	ND	ug/L	1.0	1		05/30/16 18:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 18:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 18:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 18:21	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 18:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 18:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 18:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/30/16 18:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 18:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 18:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 18:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 18:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 18:21	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		05/30/16 18:21	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		05/30/16 18:21	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		05/30/16 18:21	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**633**	mg/L	25.0	1		05/31/16 17:21		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-6 **Lab ID: 92299356002** Collected: 05/26/16 12:40 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**243**	mg/L	5.0	5		06/02/16 08:02	16887-00-6	
Fluoride	**0.46**	mg/L	0.10	1		06/01/16 23:38	16984-48-8	
Sulfate	**51.6**	mg/L	1.0	1		06/01/16 23:38	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:49	7440-38-2	
Barium	**88.3**	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:49	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:49	7440-43-9	
Calcium	**33200**	ug/L	100	1	05/31/16 18:05	06/01/16 20:49	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-48-4	
Copper	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-50-8	
Lead	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:49	7782-49-2	
Silver	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/31/16 18:05	06/01/16 20:49	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:49	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:49	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.1**	ug/L	5.0	1	06/03/16 08:54	06/06/16 10:52	7440-42-8	
Lithium	**30.6**	ug/L	0.50	1	06/03/16 08:54	06/06/16 10:52	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/31/16 15:40	06/02/16 09:19	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 18:38	67-64-1	L3
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 18:38	107-13-1	
Benzene	ND	ug/L	1.0	1		05/30/16 18:38	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 18:38	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 18:38	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/30/16 18:38	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 18:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 18:38	78-93-3	L3
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 18:38	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 18:38	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 18:38	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 18:38	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/30/16 18:38	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/30/16 18:38	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 18:38	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-6 **Lab ID: 92299356002** Collected: 05/26/16 12:40 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/30/16 18:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 18:38	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 18:38	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 18:38	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 18:38	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 18:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 18:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 18:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 18:38	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 18:38	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 18:38	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/30/16 18:38	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 18:38	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 18:38	108-10-1	
Styrene	ND	ug/L	1.0	1		05/30/16 18:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 18:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 18:38	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 18:38	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 18:38	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 18:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 18:38	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/30/16 18:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 18:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 18:38	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 18:38	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 18:38	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 18:38	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		05/30/16 18:38	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		05/30/16 18:38	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		05/30/16 18:38	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**659**	mg/L	25.0	1		05/31/16 17:21		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-7 **Lab ID: 92299356003** Collected: 05/26/16 13:55 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**327**	mg/L	8.0	8		06/02/16 08:29	16887-00-6	
Fluoride	**0.22**	mg/L	0.10	1		06/01/16 23:59	16984-48-8	
Sulfate	**19.1**	mg/L	1.0	1		06/01/16 23:59	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:52	7440-38-2	
Barium	**222**	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:52	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:52	7440-43-9	
Calcium	**51200**	ug/L	100	1	05/31/16 18:05	06/01/16 20:52	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-48-4	
Copper	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-50-8	
Lead	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:52	7782-49-2	
Silver	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/31/16 18:05	06/01/16 20:52	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:52	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:52	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**21.2**	ug/L	5.0	1	06/03/16 08:54	06/06/16 10:45	7440-42-8	
Lithium	**21.5**	ug/L	0.50	1	06/03/16 08:54	06/06/16 10:45	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/31/16 15:40	06/02/16 09:22	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 18:55	67-64-1	L3
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 18:55	107-13-1	
Benzene	ND	ug/L	1.0	1		05/30/16 18:55	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 18:55	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 18:55	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/30/16 18:55	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 18:55	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 18:55	78-93-3	L3
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 18:55	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 18:55	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 18:55	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 18:55	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/30/16 18:55	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/30/16 18:55	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 18:55	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-7 **Lab ID: 92299356003** Collected: 05/26/16 13:55 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/30/16 18:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 18:55	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 18:55	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 18:55	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 18:55	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 18:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 18:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 18:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 18:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 18:55	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 18:55	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 18:55	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/30/16 18:55	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 18:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 18:55	108-10-1	
Styrene	ND	ug/L	1.0	1		05/30/16 18:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 18:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 18:55	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 18:55	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 18:55	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 18:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 18:55	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/30/16 18:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 18:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 18:55	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 18:55	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 18:55	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 18:55	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		05/30/16 18:55	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		05/30/16 18:55	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		05/30/16 18:55	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**956**	mg/L	50.0	1		05/31/16 17:22		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-8 **Lab ID: 92299356004** Collected: 05/26/16 15:25 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**396**	mg/L	11.0	11		06/02/16 08:56	16887-00-6	M6
Fluoride	ND	mg/L	0.10	1		06/02/16 00:20	16984-48-8	
Sulfate	**6.0**	mg/L	1.0	1		06/02/16 00:20	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**7.5**	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:55	7440-38-2	
Barium	**1260**	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:55	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:55	7440-43-9	
Calcium	**144000**	ug/L	500	5	05/31/16 18:05	06/02/16 12:21	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-48-4	
Copper	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-50-8	
Lead	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:55	7782-49-2	
Silver	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/31/16 18:05	06/01/16 20:55	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:55	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:55	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.3**	ug/L	5.0	1	06/03/16 08:54	06/06/16 10:47	7440-42-8	
Lithium	**29.7**	ug/L	0.50	1	06/03/16 08:54	06/06/16 10:47	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/31/16 15:40	06/02/16 09:24	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 19:29	67-64-1	L3,M0
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 19:29	107-13-1	M1
Benzene	ND	ug/L	1.0	1		05/30/16 19:29	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 19:29	74-97-5	M1
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 19:29	75-27-4	M1
Bromoform	ND	ug/L	1.0	1		05/30/16 19:29	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 19:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 19:29	78-93-3	L3,M0
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 19:29	75-15-0	M1
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 19:29	56-23-5	M1
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 19:29	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 19:29	75-00-3	M1
Chloroform	ND	ug/L	1.0	1		05/30/16 19:29	67-66-3	M1
Chloromethane	ND	ug/L	1.0	1		05/30/16 19:29	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 19:29	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-8 **Lab ID: 92299356004** Collected: 05/26/16 15:25 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/30/16 19:29	74-95-3	M1
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 19:29	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 19:29	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 19:29	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 19:29	75-34-3	M1
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 19:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 19:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 19:29	156-59-2	M1
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 19:29	156-60-5	M1
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 19:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 19:29	10061-01-5	M1
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 19:29	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 19:29	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 19:29	591-78-6	M1
Iodomethane	ND	ug/L	5.0	1		05/30/16 19:29	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 19:29	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 19:29	108-10-1	M1
Styrene	ND	ug/L	1.0	1		05/30/16 19:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 19:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 19:29	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 19:29	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 19:29	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 19:29	71-55-6	M1
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 19:29	79-00-5	M1
Trichloroethene	ND	ug/L	1.0	1		05/30/16 19:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 19:29	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 19:29	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 19:29	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 19:29	75-01-4	M1
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 19:29	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		05/30/16 19:29	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		05/30/16 19:29	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		05/30/16 19:29	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1530**	mg/L	250	1		05/31/16 17:22		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: AMBIENT BLANK **Lab ID: 92299356005** Collected: 05/26/16 10:15 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		06/02/16 01:23	16887-00-6	
Fluoride	ND	mg/L	0.10	1		06/02/16 01:23	16984-48-8	
Sulfate	ND	mg/L	1.0	1		06/02/16 01:23	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:58	7440-38-2	
Barium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:58	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 20:58	7440-43-9	
Calcium	ND	ug/L	100	1	05/31/16 18:05	06/01/16 20:58	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-48-4	
Copper	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-50-8	
Lead	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:58	7782-49-2	
Silver	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/31/16 18:05	06/01/16 20:58	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 20:58	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 20:58	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	06/03/16 08:54	06/06/16 10:50	7440-42-8	
Lithium	ND	ug/L	0.50	1	06/03/16 08:54	06/06/16 10:50	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/31/16 15:40	06/02/16 09:31	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 16:23	67-64-1	L3
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 16:23	107-13-1	
Benzene	ND	ug/L	1.0	1		05/30/16 16:23	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 16:23	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 16:23	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/30/16 16:23	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 16:23	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 16:23	78-93-3	L3
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 16:23	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 16:23	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 16:23	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 16:23	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/30/16 16:23	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/30/16 16:23	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 16:23	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: AMBIENT BLANK **Lab ID: 92299356005** Collected: 05/26/16 10:15 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/30/16 16:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 16:23	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 16:23	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 16:23	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 16:23	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 16:23	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 16:23	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 16:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 16:23	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 16:23	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 16:23	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/30/16 16:23	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 16:23	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 16:23	108-10-1	
Styrene	ND	ug/L	1.0	1		05/30/16 16:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 16:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 16:23	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 16:23	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 16:23	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 16:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 16:23	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/30/16 16:23	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 16:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 16:23	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 16:23	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 16:23	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 16:23	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		05/30/16 16:23	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		05/30/16 16:23	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		05/30/16 16:23	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		05/31/16 17:23		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: EQ BLANK **Lab ID: 92299356006** Collected: 05/26/16 13:00 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		06/02/16 01:44	16887-00-6	
Fluoride	ND	mg/L	0.10	1		06/02/16 01:44	16984-48-8	
Sulfate	ND	mg/L	1.0	1		06/02/16 01:44	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-36-0	
Arsenic	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 21:01	7440-38-2	
Barium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-39-3	
Beryllium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 21:01	7440-41-7	
Cadmium	ND	ug/L	1.0	1	05/31/16 18:05	06/01/16 21:01	7440-43-9	
Calcium	ND	ug/L	100	1	05/31/16 18:05	06/01/16 21:01	7440-70-2	
Chromium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-47-3	
Cobalt	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-48-4	
Copper	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-50-8	
Lead	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7439-98-7	
Nickel	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-02-0	
Selenium	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 21:01	7782-49-2	
Silver	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-22-4	
Thallium	ND	ug/L	5.4	1	05/31/16 18:05	06/01/16 21:01	7440-28-0	
Vanadium	ND	ug/L	5.0	1	05/31/16 18:05	06/01/16 21:01	7440-62-2	
Zinc	ND	ug/L	10.0	1	05/31/16 18:05	06/01/16 21:01	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	06/03/16 08:54	06/06/16 11:16	7440-42-8	
Lithium	ND	ug/L	0.50	1	06/03/16 08:54	06/06/16 11:16	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	05/31/16 15:40	06/02/16 09:33	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 16:40	67-64-1	L3
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 16:40	107-13-1	
Benzene	ND	ug/L	1.0	1		05/30/16 16:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 16:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 16:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/30/16 16:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 16:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 16:40	78-93-3	L3
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 16:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 16:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 16:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 16:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/30/16 16:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/30/16 16:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 16:40	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: EQ BLANK **Lab ID: 92299356006** Collected: 05/26/16 13:00 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		05/30/16 16:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 16:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 16:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 16:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 16:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 16:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 16:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 16:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 16:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 16:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 16:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/30/16 16:40	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 16:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 16:40	108-10-1	
Styrene	ND	ug/L	1.0	1		05/30/16 16:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 16:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 16:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 16:40	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 16:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 16:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 16:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/30/16 16:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 16:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 16:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 16:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 16:40	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 16:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		05/30/16 16:40	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		05/30/16 16:40	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		05/30/16 16:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		05/31/16 17:23		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: TRIP BLANK **Lab ID: 92299356007** Collected: 05/26/16 08:00 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		05/30/16 16:57	67-64-1	L3
Acrylonitrile	ND	ug/L	10.0	1		05/30/16 16:57	107-13-1	
Benzene	ND	ug/L	1.0	1		05/30/16 16:57	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		05/30/16 16:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		05/30/16 16:57	75-27-4	
Bromoform	ND	ug/L	1.0	1		05/30/16 16:57	75-25-2	
Bromomethane	ND	ug/L	2.0	1		05/30/16 16:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		05/30/16 16:57	78-93-3	L3
Carbon disulfide	ND	ug/L	2.0	1		05/30/16 16:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		05/30/16 16:57	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		05/30/16 16:57	108-90-7	
Chloroethane	ND	ug/L	1.0	1		05/30/16 16:57	75-00-3	
Chloroform	ND	ug/L	1.0	1		05/30/16 16:57	67-66-3	
Chloromethane	ND	ug/L	1.0	1		05/30/16 16:57	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		05/30/16 16:57	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		05/30/16 16:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 16:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		05/30/16 16:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		05/30/16 16:57	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		05/30/16 16:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		05/30/16 16:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		05/30/16 16:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		05/30/16 16:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 16:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		05/30/16 16:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		05/30/16 16:57	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		05/30/16 16:57	591-78-6	
Iodomethane	ND	ug/L	5.0	1		05/30/16 16:57	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		05/30/16 16:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		05/30/16 16:57	108-10-1	
Styrene	ND	ug/L	1.0	1		05/30/16 16:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 16:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		05/30/16 16:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		05/30/16 16:57	127-18-4	
Toluene	ND	ug/L	1.0	1		05/30/16 16:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		05/30/16 16:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		05/30/16 16:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		05/30/16 16:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		05/30/16 16:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		05/30/16 16:57	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		05/30/16 16:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		05/30/16 16:57	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		05/30/16 16:57	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		05/30/16 16:57	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: TRIP BLANK **Lab ID: 92299356007** Collected: 05/26/16 08:00 Received: 05/27/16 14:16 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		05/30/16 16:57	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		05/30/16 16:57	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: GWD/3185 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 1745725 | Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	06/01/16 20:50	
Fluoride	mg/L	ND	0.10	06/01/16 20:50	
Sulfate	mg/L	ND	1.0	06/01/16 20:50	

LABORATORY CONTROL SAMPLE: 1745726

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.5	101	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	50	49.0	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745729 1745730

Parameter	Units	92299356004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	396	50	50	414	411	34	29	90-110	1	20	M6
Fluoride	mg/L	ND	2.5	2.5	2.4	2.3	92	91	90-110	1	20	
Sulfate	mg/L	6.0	50	50	56.3	56.4	101	101	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746364 1746365

Parameter	Units	92298833012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.2	50	50	52.7	54.0	101	104	90-110	2	20	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.5	95	98	90-110	3	20	
Sulfate	mg/L	2.4	50	50	52.3	53.6	100	102	90-110	2	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: MERP/9513 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 1744911 Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	06/02/16 09:03	

LABORATORY CONTROL SAMPLE: 1744912

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1744913 1744914

Parameter	Units	92299285004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.5	95	99	75-125	3	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: MPRP/21872 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 1745151 | Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	06/01/16 20:24	
Arsenic	ug/L	ND	10.0	06/01/16 20:24	
Barium	ug/L	ND	5.0	06/01/16 20:24	
Beryllium	ug/L	ND	1.0	06/01/16 20:24	
Cadmium	ug/L	ND	1.0	06/01/16 20:24	
Calcium	ug/L	ND	100	06/01/16 20:24	
Chromium	ug/L	ND	5.0	06/01/16 20:24	
Cobalt	ug/L	ND	5.0	06/01/16 20:24	
Copper	ug/L	ND	5.0	06/01/16 20:24	
Lead	ug/L	ND	5.0	06/01/16 20:24	
Molybdenum	ug/L	ND	5.0	06/01/16 20:24	
Nickel	ug/L	ND	5.0	06/01/16 20:24	
Selenium	ug/L	ND	10.0	06/01/16 20:24	
Silver	ug/L	ND	5.0	06/01/16 20:24	
Thallium	ug/L	ND	5.4	06/01/16 20:24	
Vanadium	ug/L	ND	5.0	06/01/16 20:24	
Zinc	ug/L	ND	10.0	06/01/16 20:24	

LABORATORY CONTROL SAMPLE: 1745152

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	467	93	80-120	
Arsenic	ug/L	500	452	90	80-120	
Barium	ug/L	500	465	93	80-120	
Beryllium	ug/L	500	475	95	80-120	
Cadmium	ug/L	500	467	93	80-120	
Calcium	ug/L	5000	4700	94	80-120	
Chromium	ug/L	500	478	96	80-120	
Cobalt	ug/L	500	469	94	80-120	
Copper	ug/L	500	452	90	80-120	
Lead	ug/L	500	463	93	80-120	
Molybdenum	ug/L	500	488	98	80-120	
Nickel	ug/L	500	468	94	80-120	
Selenium	ug/L	500	457	91	80-120	
Silver	ug/L	250	233	93	80-120	
Thallium	ug/L	500	462	92	80-120	
Vanadium	ug/L	500	470	94	80-120	
Zinc	ug/L	500	470	94	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745153 1745154

Parameter	Units	92299356001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	479	459	95	91	75-125	4	25	
Arsenic	ug/L	ND	500	500	468	442	94	88	75-125	5	25	
Barium	ug/L	330	500	500	808	790	95	92	75-125	2	25	
Beryllium	ug/L	ND	500	500	493	474	99	95	75-125	4	25	
Cadmium	ug/L	ND	500	500	476	454	95	91	75-125	5	25	
Calcium	ug/L	29500	5000	5000	34300	34400	96	97	75-125	0	25	
Chromium	ug/L	ND	500	500	494	468	99	93	75-125	6	25	
Cobalt	ug/L	ND	500	500	468	444	94	89	75-125	5	25	
Copper	ug/L	ND	500	500	473	448	95	90	75-125	5	25	
Lead	ug/L	ND	500	500	460	437	92	87	75-125	5	25	
Molybdenum	ug/L	ND	500	500	504	480	101	96	75-125	5	25	
Nickel	ug/L	ND	500	500	465	442	93	88	75-125	5	25	
Selenium	ug/L	ND	500	500	466	439	93	88	75-125	6	25	
Silver	ug/L	ND	250	250	240	229	96	92	75-125	5	25	
Thallium	ug/L	ND	500	500	455	438	91	87	75-125	4	25	
Vanadium	ug/L	ND	500	500	497	471	99	93	75-125	5	25	
Zinc	ug/L	ND	500	500	482	458	96	91	75-125	5	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: MPRP/63979 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 2274983 Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	06/06/16 10:40	
Lithium	ug/L	ND	0.50	06/06/16 10:40	

LABORATORY CONTROL SAMPLE: 2274984

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	92.6	93	80-120	
Lithium	ug/L	100	98.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2274985 2274986

Parameter	Units	92299356002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6.1	100	100	95.2	93.6	89	88	75-125	2	20	
Lithium	ug/L	30.6	100	100	119	121	89	91	75-125	1	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: MSV/37066 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006, 92299356007

METHOD BLANK: 1744762 Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006, 92299356007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	05/30/16 15:49	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/30/16 15:49	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	05/30/16 15:49	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/30/16 15:49	
1,1-Dichloroethane	ug/L	ND	1.0	05/30/16 15:49	
1,1-Dichloroethene	ug/L	ND	1.0	05/30/16 15:49	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/30/16 15:49	
1,2-Dichlorobenzene	ug/L	ND	1.0	05/30/16 15:49	
1,2-Dichloroethane	ug/L	ND	1.0	05/30/16 15:49	
1,2-Dichloropropane	ug/L	ND	1.0	05/30/16 15:49	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/30/16 15:49	
2-Butanone (MEK)	ug/L	ND	5.0	05/30/16 15:49	
2-Hexanone	ug/L	ND	5.0	05/30/16 15:49	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	05/30/16 15:49	
Acetone	ug/L	ND	25.0	05/30/16 15:49	
Acrylonitrile	ug/L	ND	10.0	05/30/16 15:49	
Benzene	ug/L	ND	1.0	05/30/16 15:49	
Bromochloromethane	ug/L	ND	1.0	05/30/16 15:49	
Bromodichloromethane	ug/L	ND	1.0	05/30/16 15:49	
Bromoform	ug/L	ND	1.0	05/30/16 15:49	
Bromomethane	ug/L	ND	2.0	05/30/16 15:49	
Carbon disulfide	ug/L	ND	2.0	05/30/16 15:49	
Carbon tetrachloride	ug/L	ND	1.0	05/30/16 15:49	
Chlorobenzene	ug/L	ND	1.0	05/30/16 15:49	
Chloroethane	ug/L	ND	1.0	05/30/16 15:49	
Chloroform	ug/L	ND	1.0	05/30/16 15:49	
Chloromethane	ug/L	ND	1.0	05/30/16 15:49	
cis-1,2-Dichloroethene	ug/L	ND	1.0	05/30/16 15:49	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/30/16 15:49	
Dibromochloromethane	ug/L	ND	1.0	05/30/16 15:49	
Dibromomethane	ug/L	ND	1.0	05/30/16 15:49	
Ethylbenzene	ug/L	ND	1.0	05/30/16 15:49	
Iodomethane	ug/L	ND	5.0	05/30/16 15:49	
Methylene Chloride	ug/L	ND	1.0	05/30/16 15:49	
Styrene	ug/L	ND	1.0	05/30/16 15:49	
Tetrachloroethene	ug/L	ND	1.0	05/30/16 15:49	
Toluene	ug/L	ND	1.0	05/30/16 15:49	
trans-1,2-Dichloroethene	ug/L	ND	1.0	05/30/16 15:49	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/30/16 15:49	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	05/30/16 15:49	
Trichloroethene	ug/L	ND	1.0	05/30/16 15:49	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

METHOD BLANK: 1744762 Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006, 92299356007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	05/30/16 15:49	
Vinyl acetate	ug/L	ND	2.0	05/30/16 15:49	
Vinyl chloride	ug/L	ND	1.0	05/30/16 15:49	
Xylene (Total)	ug/L	ND	2.0	05/30/16 15:49	
1,2-Dichloroethane-d4 (S)	%	103	70-130	05/30/16 15:49	
4-Bromofluorobenzene (S)	%	99	70-130	05/30/16 15:49	
Toluene-d8 (S)	%	100	70-130	05/30/16 15:49	

LABORATORY CONTROL SAMPLE: 1744763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	53.5	107	80-125	
1,1,1-Trichloroethane	ug/L	50	58.6	117	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.0	102	79-124	
1,1,2-Trichloroethane	ug/L	50	52.9	106	85-125	
1,1-Dichloroethane	ug/L	50	55.3	111	73-126	
1,1-Dichloroethene	ug/L	50	58.1	116	66-135	
1,2,3-Trichloropropane	ug/L	50	51.4	103	75-130	
1,2-Dichlorobenzene	ug/L	50	57.2	114	80-133	
1,2-Dichloroethane	ug/L	50	53.1	106	67-128	
1,2-Dichloropropane	ug/L	50	52.9	106	75-132	
1,4-Dichlorobenzene	ug/L	50	53.2	106	78-130	
2-Butanone (MEK)	ug/L	100	147	147	61-144	L0
2-Hexanone	ug/L	100	121	121	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	117	117	72-135	
Acetone	ug/L	100	201	201	48-146	L0
Acrylonitrile	ug/L	250	270	108	40-160	
Benzene	ug/L	50	54.9	110	80-125	
Bromochloromethane	ug/L	50	56.1	112	71-125	
Bromodichloromethane	ug/L	50	56.5	113	78-124	
Bromoform	ug/L	50	46.1	92	71-128	
Bromomethane	ug/L	50	41.2	82	40-160	
Carbon disulfide	ug/L	50	57.8	116	50-160	
Carbon tetrachloride	ug/L	50	60.2	120	69-131	
Chlorobenzene	ug/L	50	54.1	108	81-122	
Chloroethane	ug/L	50	50.9	102	39-148	
Chloroform	ug/L	50	56.6	113	73-127	
Chloromethane	ug/L	50	44.2	88	44-146	
cis-1,2-Dichloroethene	ug/L	50	57.5	115	74-124	
cis-1,3-Dichloropropene	ug/L	50	55.5	111	72-132	
Dibromochloromethane	ug/L	50	54.3	109	78-125	
Dibromomethane	ug/L	50	55.7	111	82-120	
Ethylbenzene	ug/L	50	53.9	108	79-121	
Iodomethane	ug/L	100	86.8	87	39-154	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

LABORATORY CONTROL SAMPLE: 1744763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	53.0	106	64-133	
Styrene	ug/L	50	55.2	110	84-126	
Tetrachloroethene	ug/L	50	50.5	101	78-122	
Toluene	ug/L	50	56.2	112	80-121	
trans-1,2-Dichloroethene	ug/L	50	57.3	115	71-127	
trans-1,3-Dichloropropene	ug/L	50	54.2	108	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	79.4	159	40-160	
Trichloroethene	ug/L	50	55.6	111	78-122	
Trichlorofluoromethane	ug/L	50	60.3	121	53-137	
Vinyl acetate	ug/L	100	118	118	40-160	
Vinyl chloride	ug/L	50	53.9	108	58-137	
Xylene (Total)	ug/L	150	159	106	81-126	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			99	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE SAMPLE: 1744765

Parameter	Units	92299356004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	25.7	129	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	28.2	141	70-130	M1
1,1,2,2-Tetrachloroethane	ug/L	ND	20	24.6	123	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	26.7	134	70-130	M1
1,1-Dichloroethane	ug/L	ND	20	26.8	134	70-130	M1
1,1-Dichloroethene	ug/L	ND	20	28.1	141	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	24.2	121	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	25.5	127	70-130	
1,2-Dichloroethane	ug/L	ND	20	26.1	130	70-130	
1,2-Dichloropropane	ug/L	ND	20	26.0	130	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	25.9	130	70-130	
2-Butanone (MEK)	ug/L	ND	40	58.9	147	70-130	M0
2-Hexanone	ug/L	ND	40	54.8	137	70-130	M1
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	56.3	141	70-130	M1
Acetone	ug/L	ND	40	55.5	131	70-130	M0
Acrylonitrile	ug/L	ND	100	137	137	70-130	M1
Benzene	ug/L	ND	20	26.7	134	70-148	
Bromochloromethane	ug/L	ND	20	27.1	135	70-130	M1
Bromodichloromethane	ug/L	ND	20	26.7	133	70-130	M1
Bromoform	ug/L	ND	20	23.1	116	70-130	
Bromomethane	ug/L	ND	20	14.5	72	70-130	
Carbon disulfide	ug/L	ND	20	28.4	142	70-130	M1
Carbon tetrachloride	ug/L	ND	20	28.2	141	70-130	M1
Chlorobenzene	ug/L	ND	20	26.8	134	70-146	
Chloroethane	ug/L	ND	20	28.2	141	70-130	M1
Chloroform	ug/L	ND	20	27.4	137	70-130	M1

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

MATRIX SPIKE SAMPLE: 1744765

Parameter	Units	92299356004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	21.0	105	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	28.4	142	70-130	M1
cis-1,3-Dichloropropene	ug/L	ND	20	26.5	132	70-130	M1
Dibromochloromethane	ug/L	ND	20	24.6	123	70-130	
Dibromomethane	ug/L	ND	20	26.2	131	70-130	M1
Ethylbenzene	ug/L	ND	20	25.9	130	70-130	
Iodomethane	ug/L	ND	40	32.8	82	70-130	
Methylene Chloride	ug/L	ND	20	24.7	124	70-130	
Styrene	ug/L	ND	20	26.0	130	70-130	
Tetrachloroethene	ug/L	ND	20	24.1	120	70-130	
Toluene	ug/L	ND	20	26.7	134	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	28.7	143	70-130	M1
trans-1,3-Dichloropropene	ug/L	ND	20	25.7	128	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	20.3	102	70-130	
Trichloroethene	ug/L	ND	20	26.2	131	69-151	
Trichlorofluoromethane	ug/L	ND	20	28.9	144	70-130	M1
Vinyl acetate	ug/L	ND	40	51.5	129	70-130	
Vinyl chloride	ug/L	ND	20	27.4	137	70-130	M1
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				102	70-130	

SAMPLE DUPLICATE: 1744764

Parameter	Units	92299356003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

SAMPLE DUPLICATE: 1744764

Parameter	Units	92299356003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	103	0		
4-Bromofluorobenzene (S)	%	100	101	1		
Toluene-d8 (S)	%	102	101	1		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: WET/45247 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 1745569 Matrix: Water
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	05/31/16 17:17	

LABORATORY CONTROL SAMPLE: 1745570

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	232	93	90-110	

SAMPLE DUPLICATE: 1745571

Parameter	Units	92299282001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	106	149	34	5	D6

SAMPLE DUPLICATE: 1745572

Parameter	Units	92299285004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	107	120	11	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: BG-1 **Lab ID: 92299356001** Collected: 05/26/16 10:00 Received: 05/27/16 14:16 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.654 ± 0.518 (0.704)** **C:NA T:95%**	pCi/L	06/20/16 22:33	13982-63-3	
Radium-228	EPA 904.0	**0.0108 ± 0.325 (0.752)** **C:74% T:90%**	pCi/L	06/17/16 16:06	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-6 **Lab ID: 92299356002** Collected: 05/26/16 12:40 Received: 05/27/16 14:16 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.075 ± 0.471 (0.953)** **C:NA T:84%**	pCi/L	06/20/16 22:58	13982-63-3	
Radium-228	EPA 904.0	**0.148 ± 0.298 (0.658)** **C:73% T:95%**	pCi/L	06/17/16 16:06	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-7 **Lab ID: 92299356003** Collected: 05/26/16 13:55 Received: 05/27/16 14:16 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0643 ± 0.333 (0.692)** **C:NA T:95%**	pCi/L	06/20/16 23:10	13982-63-3	
Radium-228	EPA 904.0	**0.126 ± 0.379 (0.849)** **C:77% T:84%**	pCi/L	06/17/16 16:06	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: MW-8 **Lab ID: 92299356004** Collected: 05/26/16 15:25 Received: 05/27/16 14:16 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.719 ± 0.657 (0.953)** **C:NA T:91%**	pCi/L	06/20/16 22:32	13982-63-3	
Radium-228	EPA 904.0	**0.521 ± 0.373 (0.723)** **C:79% T:83%**	pCi/L	06/17/16 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: AMBIENT BLANK **Lab ID: 92299356005** Collected: 05/26/16 10:15 Received: 05/27/16 14:16 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0348 ± 0.496 (0.938) C:NA T:89%**	pCi/L	06/20/16 23:04	13982-63-3	
Radium-228	EPA 904.0	**-0.123 ± 0.302 (0.730) C:77% T:89%**	pCi/L	06/17/16 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Sample: EQ BLANK **Lab ID: 92299356006** Collected: 05/26/16 13:00 Received: 05/27/16 14:16 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.380 (0.852)** **C:NA T:82%**	pCi/L	06/20/16 22:57	13982-63-3	
Radium-228	EPA 904.0	**-0.0694 ± 0.282 (0.679)** **C:77% T:84%**	pCi/L	06/17/16 16:07	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: RADC/29794 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 1087767 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.147 ± 0.353 (0.682) C:NA T:93%	pCi/L	06/20/16 22:46	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

QC Batch: RADC/29795 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92299356001, 92299356002, 92299356003, 92299356004, 92299356005, 92299356006

METHOD BLANK: 1087769 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.129 ± 0.342 (0.765) C:73% T:84%	pCi/L	06/17/16 16:05	

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

ANALYTE QUALIFIERS

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299356001	**BG-1**	EPA 300.0	GWD/3185		
92299356002	**MW-6**	EPA 300.0	GWD/3185		
92299356003	**MW-7**	EPA 300.0	GWD/3185		
92299356004	**MW-8**	EPA 300.0	GWD/3185		
92299356005	**AMBIENT BLANK**	EPA 300.0	GWD/3185		
92299356006	**EQ BLANK**	EPA 300.0	GWD/3185		
92299356001	**BG-1**	EPA 3010A	MPRP/21872	EPA 6010	ICP/19605
92299356002	**MW-6**	EPA 3010A	MPRP/21872	EPA 6010	ICP/19605
92299356003	**MW-7**	EPA 3010A	MPRP/21872	EPA 6010	ICP/19605
92299356004	**MW-8**	EPA 3010A	MPRP/21872	EPA 6010	ICP/19605
92299356005	**AMBIENT BLANK**	EPA 3010A	MPRP/21872	EPA 6010	ICP/19605
92299356006	**EQ BLANK**	EPA 3010A	MPRP/21872	EPA 6010	ICP/19605
92299356001	**BG-1**	EPA 3020	MPRP/63979	EPA 6020B	ICPM/29829
92299356002	**MW-6**	EPA 3020	MPRP/63979	EPA 6020B	ICPM/29829
92299356003	**MW-7**	EPA 3020	MPRP/63979	EPA 6020B	ICPM/29829
92299356004	**MW-8**	EPA 3020	MPRP/63979	EPA 6020B	ICPM/29829
92299356005	**AMBIENT BLANK**	EPA 3020	MPRP/63979	EPA 6020B	ICPM/29829
92299356006	**EQ BLANK**	EPA 3020	MPRP/63979	EPA 6020B	ICPM/29829
92299356001	**BG-1**	EPA 7470	MERP/9513	EPA 7470	MERC/9149
92299356002	**MW-6**	EPA 7470	MERP/9513	EPA 7470	MERC/9149
92299356003	**MW-7**	EPA 7470	MERP/9513	EPA 7470	MERC/9149
92299356004	**MW-8**	EPA 7470	MERP/9513	EPA 7470	MERC/9149
92299356005	**AMBIENT BLANK**	EPA 7470	MERP/9513	EPA 7470	MERC/9149
92299356006	**EQ BLANK**	EPA 7470	MERP/9513	EPA 7470	MERC/9149
92299356001	**BG-1**	EPA 8260	MSV/37066		
92299356002	**MW-6**	EPA 8260	MSV/37066		
92299356003	**MW-7**	EPA 8260	MSV/37066		
92299356004	**MW-8**	EPA 8260	MSV/37066		
92299356005	**AMBIENT BLANK**	EPA 8260	MSV/37066		
92299356006	**EQ BLANK**	EPA 8260	MSV/37066		
92299356007	**TRIP BLANK**	EPA 8260	MSV/37066		
92299356001	**BG-1**	EPA 903.1	RADC/29794		
92299356002	**MW-6**	EPA 903.1	RADC/29794		
92299356003	**MW-7**	EPA 903.1	RADC/29794		
92299356004	**MW-8**	EPA 903.1	RADC/29794		
92299356005	**AMBIENT BLANK**	EPA 903.1	RADC/29794		
92299356006	**EQ BLANK**	EPA 903.1	RADC/29794		
92299356001	**BG-1**	EPA 904.0	RADC/29795		
92299356002	**MW-6**	EPA 904.0	RADC/29795		
92299356003	**MW-7**	EPA 904.0	RADC/29795		
92299356004	**MW-8**	EPA 904.0	RADC/29795		
92299356005	**AMBIENT BLANK**	EPA 904.0	RADC/29795		
92299356006	**EQ BLANK**	EPA 904.0	RADC/29795		
92299356001	**BG-1**	SM 2540C	WET/45247		
92299356002	**MW-6**	SM 2540C	WET/45247		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299356

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299356003	**MW-7**	SM 2540C	WET/45247		
92299356004	**MW-8**	SM 2540C	WET/45247		
92299356005	**AMBIENT BLANK**	SM 2540C	WET/45247		
92299356006	**EQ BLANK**	SM 2540C	WET/45247		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised:April 25, 2016 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.19**	Issuing Authority: Pace Huntersville Quality Offi

WO# : 92299356

92299356

Use ONLY

Sample Condition Upon Receipt

Client Name: Chattah

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ C ☐ Commercial ☑ Pace ☐ Other:_____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: 5/27

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:_____

Thermometer: T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 3.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNC3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☐ Yes	☐ No	☐ N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	☐ Yes	☐ No	☑ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	12.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	13.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):_____				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: JY **Date:** 5/31/16

Project Manager SRF Review: JY **Date:** 5/31/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2043530

Section A Required Client Information:

Company: Chastain
Address:
Email To:
Phone: Fax:
Requested Due Date/TAT:

Section B Required Project Information:

Report To:
Copy To:
Purchase Order No.:
Project Name: Brickhaven
Project Number:

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #: 7672-1

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END/GRAB DATE	COLLECTED END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	RAD	Metals	8260	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BG-1		G	05/26/16	1000				11										3	2	3	1	1	1		001
2	MW-6		G	05/26/16	1240				11										3	2	3	1	1	1		002
3	MW-7		G	05/26/16	1355				11										3	2	3	1	1	1		003
4	MW-8		G	05/26/16	1525				11										3	2	3	1	1	1		004
5	Trip Blank		G	05/26/16	0800				2												2					005
6	Ambient Blank		G	05/26/16	1015				11										3	2	3	1	1	1		006
7	Eq. Blank		G	05/26/16	1300				11										3	2	3	1	1	1		007
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Clint Sorrell / PACE	05/26/16	1700	[signature] PACE HVL	5-27-16	1416	3.2	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 05/26/16

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 21, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on May 31, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92299484001	**MW-1**	Water	05/27/16 11:05	05/31/16 08:22
92299484002	**MW-1-FD**	Water	05/27/16 11:20	05/31/16 08:22
92299484003	**MW-2**	Water	05/27/16 13:40	05/31/16 08:22
92299484004	**MW-3**	Water	05/27/16 15:05	05/31/16 08:22
92299484005	**AMBIENT BLANK**	Water	05/27/16 11:30	05/31/16 08:22
92299484006	**EQ. BLANK**	Water	05/27/16 14:00	05/31/16 08:22
92299484007	**TRIP BLANK**	Water	05/27/16 08:00	05/31/16 08:22

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92299484001	**MW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299484002	**MW-1-FD**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299484003	**MW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299484004	**MW-3**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299484005	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299484006	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	TT3	2	PASI-M
		EPA 7470	ANB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MSH	1	PASI-A
92299484007	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299484001	**MW-1**					
EPA 300.0	Chloride	307	mg/L	7.0	06/03/16 04:36	
EPA 300.0	Fluoride	0.11	mg/L	0.10	06/02/16 20:48	
EPA 300.0	Sulfate	10.9	mg/L	1.0	06/02/16 20:48	
EPA 6010	Barium	121	ug/L	5.0	06/03/16 16:44	
EPA 6010	Calcium	87800	ug/L	100	06/03/16 16:44	
EPA 6020B	Boron	9.7	ug/L	5.0	06/02/16 13:27	
EPA 6020B	Lithium	27.5	ug/L	0.50	06/02/16 13:27	
EPA 903.1	Radium-226	0.254 ± 0.291 (0.172) C:NA T:98%	pCi/L		06/20/16 22:45	
EPA 904.0	Radium-228	-0.0467 ± 0.313 (0.740) C:77% T:85%	pCi/L		06/17/16 16:07	
SM 2540C	Total Dissolved Solids	920	mg/L	25.0	06/01/16 17:15	
92299484002	**MW-1-FD**					
EPA 300.0	Chloride	325	mg/L	8.0	06/03/16 05:03	
EPA 300.0	Fluoride	0.11	mg/L	0.10	06/02/16 21:09	
EPA 300.0	Sulfate	10.2	mg/L	1.0	06/02/16 21:09	
EPA 6010	Barium	134	ug/L	5.0	06/03/16 17:02	
EPA 6010	Calcium	93400	ug/L	100	06/03/16 17:02	
EPA 6020B	Boron	9.6	ug/L	5.0	06/02/16 13:51	
EPA 6020B	Lithium	28.6	ug/L	0.50	06/02/16 13:51	
EPA 903.1	Radium-226	0.000 ± 0.427 (0.926) C:NA T:82%	pCi/L		06/20/16 23:28	
EPA 904.0	Radium-228	0.431 ± 0.364 (0.730) C:75% T:86%	pCi/L		06/17/16 16:08	
SM 2540C	Total Dissolved Solids	1090	mg/L	50.0	06/01/16 17:15	
92299484003	**MW-2**					
EPA 300.0	Chloride	933	mg/L	50.0	06/03/16 08:22	
EPA 300.0	Fluoride	0.13	mg/L	0.10	06/02/16 21:30	
EPA 300.0	Sulfate	163	mg/L	50.0	06/03/16 08:22	
EPA 6010	Antimony	8.9	ug/L	5.0	06/03/16 17:05	
EPA 6010	Barium	197	ug/L	5.0	06/03/16 17:05	
EPA 6010	Calcium	130000	ug/L	500	06/03/16 17:43	
EPA 6010	Molybdenum	10.1	ug/L	5.0	06/03/16 17:05	
EPA 6020B	Boron	40.5	ug/L	25.0	06/02/16 13:54	
EPA 6020B	Lithium	350	ug/L	2.5	06/02/16 13:54	
EPA 903.1	Radium-226	0.690 ± 0.512 (0.641) C:NA T:89%	pCi/L		06/20/16 23:22	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92299484003	**MW-2**					
EPA 904.0	Radium-228	0.433 ± 0.352 (0.697) C:73% T:86%	pCi/L		06/17/16 16:08	
SM 2540C	Total Dissolved Solids	2870	mg/L	250	06/01/16 17:15	
92299484004	**MW-3**					
EPA 300.0	Chloride	1130	mg/L	50.0	06/03/16 08:48	M6
EPA 300.0	Fluoride	0.21	mg/L	0.10	06/02/16 21:51	
EPA 300.0	Sulfate	16.8	mg/L	1.0	06/02/16 21:51	
EPA 6010	Antimony	10.7	ug/L	5.0	06/03/16 17:09	
EPA 6010	Barium	728	ug/L	5.0	06/03/16 17:09	
EPA 6010	Calcium	161000	ug/L	500	06/03/16 17:46	
EPA 6010	Molybdenum	10.2	ug/L	5.0	06/03/16 17:09	
EPA 6020B	Boron	39.0	ug/L	25.0	06/02/16 13:56	
EPA 6020B	Lithium	102	ug/L	2.5	06/02/16 13:56	
EPA 903.1	Radium-226	1.24 ± 0.622 (0.508) C:NA T:93%	pCi/L		06/20/16 23:11	
EPA 904.0	Radium-228	1.75 ± 0.540 (0.667) C:77% T:87%	pCi/L		06/17/16 16:08	
SM 2540C	Total Dissolved Solids	3180	mg/L	250	06/01/16 17:16	
92299484005	**AMBIENT BLANK**					
EPA 903.1	Radium-226	0.000 ± 0.317 (0.511) C:NA T:92%	pCi/L		06/20/16 23:40	
EPA 904.0	Radium-228	-0.131 ± 0.331 (0.797) C:75% T:87%	pCi/L		06/17/16 16:08	
92299484006	**EQ. BLANK**					
EPA 903.1	Radium-226	0.137 ± 0.313 (0.186) C:NA T:91%	pCi/L		06/21/16 00:05	
EPA 904.0	Radium-228	0.226 ± 0.365 (0.793) C:74% T:79%	pCi/L		06/17/16 16:08	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-1 **Lab ID: 92299484001** Collected: 05/27/16 11:05 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**307**	mg/L	7.0	7		06/03/16 04:36	16887-00-6	
Fluoride	**0.11**	mg/L	0.10	1		06/02/16 20:48	16984-48-8	
Sulfate	**10.9**	mg/L	1.0	1		06/02/16 20:48	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-36-0	
Arsenic	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 16:44	7440-38-2	
Barium	**121**	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-39-3	
Beryllium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 16:44	7440-41-7	
Cadmium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 16:44	7440-43-9	
Calcium	**87800**	ug/L	100	1	06/01/16 17:45	06/03/16 16:44	7440-70-2	
Chromium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-47-3	
Cobalt	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-48-4	
Copper	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-50-8	
Lead	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7439-98-7	
Nickel	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-02-0	
Selenium	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 16:44	7782-49-2	
Silver	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-22-4	
Thallium	ND	ug/L	5.4	1	06/01/16 17:45	06/03/16 16:44	7440-28-0	
Vanadium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 16:44	7440-62-2	
Zinc	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 16:44	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.7**	ug/L	5.0	1	06/01/16 21:40	06/02/16 13:27	7440-42-8	
Lithium	**27.5**	ug/L	0.50	1	06/01/16 21:40	06/02/16 13:27	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	06/01/16 10:30	06/02/16 11:01	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 15:14	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 15:14	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 15:14	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 15:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 15:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 15:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 15:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 15:14	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 15:14	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 15:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 15:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 15:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 15:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 15:14	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 15:14	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-1 **Lab ID: 92299484001** Collected: 05/27/16 11:05 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		06/02/16 15:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 15:14	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 15:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 15:14	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 15:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 15:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 15:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 15:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 15:14	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 15:14	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 15:14	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 15:14	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 15:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 15:14	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 15:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 15:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 15:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 15:14	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 15:14	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 15:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 15:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 15:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 15:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 15:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 15:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 15:14	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 15:14	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		06/02/16 15:14	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	70-130	1		06/02/16 15:14	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		06/02/16 15:14	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**920**	mg/L	25.0	1		06/01/16 17:15		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-1-FD **Lab ID: 92299484002** Collected: 05/27/16 11:20 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**325**	mg/L	8.0	8		06/03/16 05:03	16887-00-6	
Fluoride	**0.11**	mg/L	0.10	1		06/02/16 21:09	16984-48-8	
Sulfate	**10.2**	mg/L	1.0	1		06/02/16 21:09	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-36-0	
Arsenic	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:02	7440-38-2	
Barium	**134**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-39-3	
Beryllium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:02	7440-41-7	
Cadmium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:02	7440-43-9	
Calcium	**93400**	ug/L	100	1	06/01/16 17:45	06/03/16 17:02	7440-70-2	
Chromium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-47-3	
Cobalt	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-48-4	
Copper	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-50-8	
Lead	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7439-98-7	
Nickel	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-02-0	
Selenium	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:02	7782-49-2	
Silver	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-22-4	
Thallium	ND	ug/L	5.4	1	06/01/16 17:45	06/03/16 17:02	7440-28-0	
Vanadium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:02	7440-62-2	
Zinc	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:02	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.6**	ug/L	5.0	1	06/01/16 21:40	06/02/16 13:51	7440-42-8	
Lithium	**28.6**	ug/L	0.50	1	06/01/16 21:40	06/02/16 13:51	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	06/01/16 10:30	06/02/16 11:03	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 15:32	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 15:32	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 15:32	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 15:32	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 15:32	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 15:32	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 15:32	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 15:32	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 15:32	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 15:32	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 15:32	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 15:32	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 15:32	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 15:32	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 15:32	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-1-FD **Lab ID: 92299484002** Collected: 05/27/16 11:20 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		06/02/16 15:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 15:32	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 15:32	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 15:32	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 15:32	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 15:32	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:32	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 15:32	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 15:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 15:32	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 15:32	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 15:32	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 15:32	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 15:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 15:32	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 15:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 15:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 15:32	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 15:32	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 15:32	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 15:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 15:32	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 15:32	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 15:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 15:32	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 15:32	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 15:32	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 15:32	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		06/02/16 15:32	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		06/02/16 15:32	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		06/02/16 15:32	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1090**	mg/L	50.0	1		06/01/16 17:15		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-2 **Lab ID: 92299484003** Collected: 05/27/16 13:40 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**933**	mg/L	50.0	50		06/03/16 08:22	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		06/02/16 21:30	16984-48-8	
Sulfate	**163**	mg/L	50.0	50		06/03/16 08:22	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**8.9**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-36-0	
Arsenic	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:05	7440-38-2	
Barium	**197**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-39-3	
Beryllium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:05	7440-41-7	
Cadmium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:05	7440-43-9	
Calcium	**130000**	ug/L	500	5	06/01/16 17:45	06/03/16 17:43	7440-70-2	
Chromium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-47-3	
Cobalt	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-48-4	
Copper	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-50-8	
Lead	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7439-92-1	
Molybdenum	**10.1**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7439-98-7	
Nickel	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-02-0	
Selenium	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:05	7782-49-2	
Silver	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-22-4	
Thallium	ND	ug/L	5.4	1	06/01/16 17:45	06/03/16 17:05	7440-28-0	
Vanadium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:05	7440-62-2	
Zinc	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:05	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**40.5**	ug/L	25.0	5	06/01/16 21:40	06/02/16 13:54	7440-42-8	
Lithium	**350**	ug/L	2.5	5	06/01/16 21:40	06/02/16 13:54	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	06/01/16 10:30	06/02/16 11:06	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 15:49	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 15:49	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 15:49	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 15:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 15:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 15:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 15:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 15:49	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 15:49	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 15:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 15:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 15:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 15:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 15:49	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 15:49	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-2 **Lab ID: 92299484003** Collected: 05/27/16 13:40 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		06/02/16 15:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 15:49	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 15:49	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 15:49	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 15:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 15:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 15:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 15:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 15:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 15:49	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 15:49	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 15:49	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 15:49	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 15:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 15:49	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 15:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 15:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 15:49	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 15:49	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 15:49	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 15:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 15:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 15:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 15:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 15:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 15:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 15:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 15:49	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	105	%	70-130	1		06/02/16 15:49	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		06/02/16 15:49	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		06/02/16 15:49	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2870**	mg/L	250	1		06/01/16 17:15		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-3 **Lab ID: 92299484004** Collected: 05/27/16 15:05 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1130**	mg/L	50.0	50		06/03/16 08:48	16887-00-6	M6
Fluoride	**0.21**	mg/L	0.10	1		06/02/16 21:51	16984-48-8	
Sulfate	**16.8**	mg/L	1.0	1		06/02/16 21:51	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**10.7**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:09	7440-38-2	
Barium	**728**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:09	7440-43-9	
Calcium	**161000**	ug/L	500	5	06/01/16 17:45	06/03/16 17:46	7440-70-2	
Chromium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-47-3	
Cobalt	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-48-4	
Copper	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-50-8	
Lead	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7439-92-1	
Molybdenum	**10.2**	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7439-98-7	
Nickel	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:09	7782-49-2	
Silver	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-22-4	
Thallium	ND	ug/L	5.4	1	06/01/16 17:45	06/03/16 17:09	7440-28-0	
Vanadium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:09	7440-62-2	
Zinc	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:09	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**39.0**	ug/L	25.0	5	06/01/16 21:40	06/02/16 13:56	7440-42-8	
Lithium	**102**	ug/L	2.5	5	06/01/16 21:40	06/02/16 13:56	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	06/01/16 10:30	06/02/16 11:08	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 16:24	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 16:24	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 16:24	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 16:24	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 16:24	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 16:24	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 16:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 16:24	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 16:24	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 16:24	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 16:24	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 16:24	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 16:24	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 16:24	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 16:24	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-3 **Lab ID: 92299484004** Collected: 05/27/16 15:05 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		06/02/16 16:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 16:24	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 16:24	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 16:24	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 16:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 16:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 16:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 16:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 16:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 16:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 16:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 16:24	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 16:24	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 16:24	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 16:24	74-88-4	M1
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 16:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 16:24	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 16:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 16:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 16:24	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 16:24	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 16:24	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 16:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 16:24	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 16:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 16:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 16:24	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 16:24	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 16:24	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 16:24	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		06/02/16 16:24	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		06/02/16 16:24	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		06/02/16 16:24	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**3180**	mg/L	250	1		06/01/16 17:16		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: AMBIENT BLANK **Lab ID: 92299484005** Collected: 05/27/16 11:30 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		06/02/16 23:37	16887-00-6	
Fluoride	ND	mg/L	0.10	1		06/02/16 23:37	16984-48-8	
Sulfate	ND	mg/L	1.0	1		06/02/16 23:37	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-36-0	
Arsenic	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:12	7440-38-2	
Barium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-39-3	
Beryllium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:12	7440-41-7	
Cadmium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:12	7440-43-9	
Calcium	ND	ug/L	100	1	06/01/16 17:45	06/03/16 17:12	7440-70-2	
Chromium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-47-3	
Cobalt	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-48-4	
Copper	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-50-8	
Lead	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7439-98-7	
Nickel	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-02-0	
Selenium	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:12	7782-49-2	
Silver	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-22-4	
Thallium	ND	ug/L	5.4	1	06/01/16 17:45	06/03/16 17:12	7440-28-0	
Vanadium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:12	7440-62-2	
Zinc	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:12	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	06/01/16 21:40	06/02/16 13:59	7440-42-8	
Lithium	ND	ug/L	0.50	1	06/01/16 21:40	06/02/16 13:59	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	06/01/16 10:30	06/02/16 11:10	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 14:22	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 14:22	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 14:22	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 14:22	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 14:22	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 14:22	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 14:22	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 14:22	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 14:22	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 14:22	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 14:22	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 14:22	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 14:22	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 14:22	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 14:22	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: AMBIENT BLANK **Lab ID: 92299484005** Collected: 05/27/16 11:30 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		06/02/16 14:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 14:22	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 14:22	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 14:22	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 14:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 14:22	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 14:22	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 14:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 14:22	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 14:22	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 14:22	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 14:22	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 14:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 14:22	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 14:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 14:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 14:22	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 14:22	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 14:22	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 14:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 14:22	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 14:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 14:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 14:22	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 14:22	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 14:22	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 14:22	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		06/02/16 14:22	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		06/02/16 14:22	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		06/02/16 14:22	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		06/01/16 17:16		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: EQ. BLANK **Lab ID: 92299484006** Collected: 05/27/16 14:00 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		06/02/16 23:58	16887-00-6	
Fluoride	ND	mg/L	0.10	1		06/02/16 23:58	16984-48-8	
Sulfate	ND	mg/L	1.0	1		06/02/16 23:58	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-36-0	
Arsenic	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:15	7440-38-2	
Barium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-39-3	
Beryllium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:15	7440-41-7	
Cadmium	ND	ug/L	1.0	1	06/01/16 17:45	06/03/16 17:15	7440-43-9	
Calcium	ND	ug/L	100	1	06/01/16 17:45	06/03/16 17:15	7440-70-2	
Chromium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-47-3	
Cobalt	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-48-4	
Copper	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-50-8	
Lead	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7439-98-7	
Nickel	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-02-0	
Selenium	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:15	7782-49-2	
Silver	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-22-4	
Thallium	ND	ug/L	5.4	1	06/01/16 17:45	06/03/16 17:15	7440-28-0	
Vanadium	ND	ug/L	5.0	1	06/01/16 17:45	06/03/16 17:15	7440-62-2	
Zinc	ND	ug/L	10.0	1	06/01/16 17:45	06/03/16 17:15	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	06/01/16 21:40	06/02/16 14:01	7440-42-8	
Lithium	ND	ug/L	0.50	1	06/01/16 21:40	06/02/16 14:01	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	06/01/16 10:30	06/02/16 11:13	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 14:40	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 14:40	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 14:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 14:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 14:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 14:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 14:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 14:40	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 14:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 14:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 14:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 14:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 14:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 14:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 14:40	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: EQ. BLANK **Lab ID: 92299484006** Collected: 05/27/16 14:00 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		06/02/16 14:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 14:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 14:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 14:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 14:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 14:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 14:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 14:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 14:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 14:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 14:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 14:40	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 14:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 14:40	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 14:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 14:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 14:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 14:40	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 14:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 14:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 14:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 14:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 14:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 14:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 14:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 14:40	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 14:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		06/02/16 14:40	460-00-4	
1,2-Dichloroethane-d4 (S)	107	%	70-130	1		06/02/16 14:40	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		06/02/16 14:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		06/01/16 17:16		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: TRIP BLANK **Lab ID: 92299484007** Collected: 05/27/16 08:00 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		06/02/16 14:57	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		06/02/16 14:57	107-13-1	
Benzene	ND	ug/L	1.0	1		06/02/16 14:57	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		06/02/16 14:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		06/02/16 14:57	75-27-4	
Bromoform	ND	ug/L	1.0	1		06/02/16 14:57	75-25-2	
Bromomethane	ND	ug/L	2.0	1		06/02/16 14:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		06/02/16 14:57	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		06/02/16 14:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		06/02/16 14:57	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		06/02/16 14:57	108-90-7	
Chloroethane	ND	ug/L	1.0	1		06/02/16 14:57	75-00-3	
Chloroform	ND	ug/L	1.0	1		06/02/16 14:57	67-66-3	
Chloromethane	ND	ug/L	1.0	1		06/02/16 14:57	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		06/02/16 14:57	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		06/02/16 14:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 14:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		06/02/16 14:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		06/02/16 14:57	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		06/02/16 14:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		06/02/16 14:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		06/02/16 14:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		06/02/16 14:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 14:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		06/02/16 14:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		06/02/16 14:57	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		06/02/16 14:57	591-78-6	
Iodomethane	ND	ug/L	5.0	1		06/02/16 14:57	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		06/02/16 14:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		06/02/16 14:57	108-10-1	
Styrene	ND	ug/L	1.0	1		06/02/16 14:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 14:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		06/02/16 14:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		06/02/16 14:57	127-18-4	
Toluene	ND	ug/L	1.0	1		06/02/16 14:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		06/02/16 14:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		06/02/16 14:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		06/02/16 14:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		06/02/16 14:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		06/02/16 14:57	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		06/02/16 14:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		06/02/16 14:57	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		06/02/16 14:57	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		06/02/16 14:57	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: TRIP BLANK **Lab ID: 92299484007** Collected: 05/27/16 08:00 Received: 05/31/16 08:22 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%	70-130	1		06/02/16 14:57	17060-07-0	
Toluene-d8 (S)	98	%	70-130	1		06/02/16 14:57	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: GWD/3190 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 1746847 | Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	06/02/16 13:27	
Fluoride	mg/L	ND	0.10	06/02/16 13:27	
Sulfate	mg/L	ND	1.0	06/02/16 13:27	

LABORATORY CONTROL SAMPLE: 1746848

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.8	102	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	50	49.6	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746849 1746850

Parameter	Units	92299431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	33.2	50	50	84.5	85.5	102	105	90-110	1	20	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.5	98	101	90-110	3	20	
Sulfate	mg/L	8.8	50	50	59.8	60.8	102	104	90-110	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746851 1746852

Parameter	Units	92299484004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1130	50	50	1260	1220	250	166	90-110	3	20	M6
Fluoride	mg/L	0.21	2.5	2.5	2.5	2.6	93	95	90-110	1	20	
Sulfate	mg/L	16.8	50	50	66.9	67.0	100	100	90-110	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: MERP/9523 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 1745670 Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	06/02/16 10:09	

LABORATORY CONTROL SAMPLE: 1745671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1745672 1745673

Parameter	Units	92299431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.5	96	98	75-125	2	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: MPRP/21888 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 1746336 Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	06/03/16 16:38	
Arsenic	ug/L	ND	10.0	06/03/16 16:38	
Barium	ug/L	ND	5.0	06/03/16 16:38	
Beryllium	ug/L	ND	1.0	06/03/16 16:38	
Cadmium	ug/L	ND	1.0	06/03/16 16:38	
Calcium	ug/L	ND	100	06/03/16 16:38	
Chromium	ug/L	ND	5.0	06/03/16 16:38	
Cobalt	ug/L	ND	5.0	06/03/16 16:38	
Copper	ug/L	ND	5.0	06/03/16 16:38	
Lead	ug/L	ND	5.0	06/03/16 16:38	
Molybdenum	ug/L	ND	5.0	06/03/16 16:38	
Nickel	ug/L	ND	5.0	06/03/16 16:38	
Selenium	ug/L	ND	10.0	06/03/16 16:38	
Silver	ug/L	ND	5.0	06/03/16 16:38	
Thallium	ug/L	ND	5.4	06/03/16 16:38	
Vanadium	ug/L	ND	5.0	06/03/16 16:38	
Zinc	ug/L	ND	10.0	06/03/16 16:38	

LABORATORY CONTROL SAMPLE: 1746337

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	474	95	80-120	
Arsenic	ug/L	500	460	92	80-120	
Barium	ug/L	500	473	95	80-120	
Beryllium	ug/L	500	454	91	80-120	
Cadmium	ug/L	500	481	96	80-120	
Calcium	ug/L	5000	4700	94	80-120	
Chromium	ug/L	500	466	93	80-120	
Cobalt	ug/L	500	472	94	80-120	
Copper	ug/L	500	470	94	80-120	
Lead	ug/L	500	469	94	80-120	
Molybdenum	ug/L	500	501	100	80-120	
Nickel	ug/L	500	482	96	80-120	
Selenium	ug/L	500	467	93	80-120	
Silver	ug/L	250	234	93	80-120	
Thallium	ug/L	500	452	90	80-120	
Vanadium	ug/L	500	459	92	80-120	
Zinc	ug/L	500	468	94	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1746338 1746339

Parameter	Units	92299484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	467	474	93	94	75-125	1	25	
Arsenic	ug/L	ND	500	500	463	465	93	93	75-125	0	25	
Barium	ug/L	121	500	500	580	587	92	93	75-125	1	25	
Beryllium	ug/L	ND	500	500	450	457	90	91	75-125	2	25	
Cadmium	ug/L	ND	500	500	471	477	94	95	75-125	1	25	
Calcium	ug/L	87800	5000	5000	92300	92500	89	92	75-125	0	25	
Chromium	ug/L	ND	500	500	453	458	91	91	75-125	1	25	
Cobalt	ug/L	ND	500	500	443	449	89	90	75-125	1	25	
Copper	ug/L	ND	500	500	461	463	92	93	75-125	1	25	
Lead	ug/L	ND	500	500	446	450	89	90	75-125	1	25	
Molybdenum	ug/L	ND	500	500	494	501	99	100	75-125	1	25	
Nickel	ug/L	ND	500	500	450	456	90	91	75-125	1	25	
Selenium	ug/L	ND	500	500	456	464	91	93	75-125	2	25	
Silver	ug/L	ND	250	250	230	230	92	92	75-125	0	25	
Thallium	ug/L	ND	500	500	429	438	86	88	75-125	2	25	
Vanadium	ug/L	ND	500	500	459	463	92	92	75-125	1	25	
Zinc	ug/L	ND	500	500	446	452	89	90	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: MPRP/63927 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 | Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 2273909 | Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	06/02/16 13:20	
Lithium	ug/L	ND	0.50	06/02/16 13:20	

LABORATORY CONTROL SAMPLE: 2273910

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	94.8	95	80-120	
Lithium	ug/L	100	101	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2273911 2273912

Parameter	Units	92299484001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	9.7	100	100	91.4	106	82	97	75-125	15	20	
Lithium	ug/L	27.5	100	100	112	128	84	101	75-125	14	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: MSV/37110 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006, 92299484007

METHOD BLANK: 1746999 Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006, 92299484007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	06/02/16 12:21	
1,1,1-Trichloroethane	ug/L	ND	1.0	06/02/16 12:21	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	06/02/16 12:21	
1,1,2-Trichloroethane	ug/L	ND	1.0	06/02/16 12:21	
1,1-Dichloroethane	ug/L	ND	1.0	06/02/16 12:21	
1,1-Dichloroethene	ug/L	ND	1.0	06/02/16 12:21	
1,2,3-Trichloropropane	ug/L	ND	1.0	06/02/16 12:21	
1,2-Dichlorobenzene	ug/L	ND	1.0	06/02/16 12:21	
1,2-Dichloroethane	ug/L	ND	1.0	06/02/16 12:21	
1,2-Dichloropropane	ug/L	ND	1.0	06/02/16 12:21	
1,4-Dichlorobenzene	ug/L	ND	1.0	06/02/16 12:21	
2-Butanone (MEK)	ug/L	ND	5.0	06/02/16 12:21	
2-Hexanone	ug/L	ND	5.0	06/02/16 12:21	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	06/02/16 12:21	
Acetone	ug/L	ND	25.0	06/02/16 12:21	
Acrylonitrile	ug/L	ND	10.0	06/02/16 12:21	
Benzene	ug/L	ND	1.0	06/02/16 12:21	
Bromochloromethane	ug/L	ND	1.0	06/02/16 12:21	
Bromodichloromethane	ug/L	ND	1.0	06/02/16 12:21	
Bromoform	ug/L	ND	1.0	06/02/16 12:21	
Bromomethane	ug/L	ND	2.0	06/02/16 12:21	
Carbon disulfide	ug/L	ND	2.0	06/02/16 12:21	
Carbon tetrachloride	ug/L	ND	1.0	06/02/16 12:21	
Chlorobenzene	ug/L	ND	1.0	06/02/16 12:21	
Chloroethane	ug/L	ND	1.0	06/02/16 12:21	
Chloroform	ug/L	ND	1.0	06/02/16 12:21	
Chloromethane	ug/L	ND	1.0	06/02/16 12:21	
cis-1,2-Dichloroethene	ug/L	ND	1.0	06/02/16 12:21	
cis-1,3-Dichloropropene	ug/L	ND	1.0	06/02/16 12:21	
Dibromochloromethane	ug/L	ND	1.0	06/02/16 12:21	
Dibromomethane	ug/L	ND	1.0	06/02/16 12:21	
Ethylbenzene	ug/L	ND	1.0	06/02/16 12:21	
Iodomethane	ug/L	ND	5.0	06/02/16 12:21	
Methylene Chloride	ug/L	ND	1.0	06/02/16 12:21	
Styrene	ug/L	ND	1.0	06/02/16 12:21	
Tetrachloroethene	ug/L	ND	1.0	06/02/16 12:21	
Toluene	ug/L	ND	1.0	06/02/16 12:21	
trans-1,2-Dichloroethene	ug/L	ND	1.0	06/02/16 12:21	
trans-1,3-Dichloropropene	ug/L	ND	1.0	06/02/16 12:21	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	06/02/16 12:21	
Trichloroethene	ug/L	ND	1.0	06/02/16 12:21	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

METHOD BLANK: 1746999 Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006, 92299484007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	06/02/16 12:21	
Vinyl acetate	ug/L	ND	2.0	06/02/16 12:21	
Vinyl chloride	ug/L	ND	1.0	06/02/16 12:21	
Xylene (Total)	ug/L	ND	2.0	06/02/16 12:21	
1,2-Dichloroethane-d4 (S)	%	108	70-130	06/02/16 12:21	
4-Bromofluorobenzene (S)	%	102	70-130	06/02/16 12:21	
Toluene-d8 (S)	%	100	70-130	06/02/16 12:21	

LABORATORY CONTROL SAMPLE: 1747000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	45.9	92	80-125	
1,1,1-Trichloroethane	ug/L	50	44.6	89	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	46.0	92	79-124	
1,1,2-Trichloroethane	ug/L	50	47.5	95	85-125	
1,1-Dichloroethane	ug/L	50	43.5	87	73-126	
1,1-Dichloroethene	ug/L	50	45.5	91	66-135	
1,2,3-Trichloropropane	ug/L	50	43.8	88	75-130	
1,2-Dichlorobenzene	ug/L	50	50.9	102	80-133	
1,2-Dichloroethane	ug/L	50	47.8	96	67-128	
1,2-Dichloropropane	ug/L	50	43.5	87	75-132	
1,4-Dichlorobenzene	ug/L	50	48.9	98	78-130	
2-Butanone (MEK)	ug/L	100	92.7	93	61-144	
2-Hexanone	ug/L	100	81.1	81	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	84.7	85	72-135	
Acetone	ug/L	100	92.4	92	48-146	
Acrylonitrile	ug/L	250	204	82	40-160	
Benzene	ug/L	50	46.6	93	80-125	
Bromochloromethane	ug/L	50	52.5	105	71-125	
Bromodichloromethane	ug/L	50	49.0	98	78-124	
Bromoform	ug/L	50	49.7	99	71-128	
Bromomethane	ug/L	50	43.3	87	40-160	
Carbon disulfide	ug/L	50	49.6	99	50-160	
Carbon tetrachloride	ug/L	50	48.0	96	69-131	
Chlorobenzene	ug/L	50	46.4	93	81-122	
Chloroethane	ug/L	50	44.8	90	39-148	
Chloroform	ug/L	50	45.7	91	73-127	
Chloromethane	ug/L	50	43.8	88	44-146	
cis-1,2-Dichloroethene	ug/L	50	44.9	90	74-124	
cis-1,3-Dichloropropene	ug/L	50	46.8	94	72-132	
Dibromochloromethane	ug/L	50	47.5	95	78-125	
Dibromomethane	ug/L	50	49.5	99	82-120	
Ethylbenzene	ug/L	50	45.8	92	79-121	
Iodomethane	ug/L	100	94.6	95	39-154	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

LABORATORY CONTROL SAMPLE: 1747000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.2	98	64-133	
Styrene	ug/L	50	50.8	102	84-126	
Tetrachloroethene	ug/L	50	45.0	90	78-122	
Toluene	ug/L	50	47.6	95	80-121	
trans-1,2-Dichloroethene	ug/L	50	46.8	94	71-127	
trans-1,3-Dichloropropene	ug/L	50	47.1	94	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	65.7	131	40-160	
Trichloroethene	ug/L	50	46.8	94	78-122	
Trichlorofluoromethane	ug/L	50	45.0	90	53-137	
Vinyl acetate	ug/L	100	81.8	82	40-160	
Vinyl chloride	ug/L	50	41.3	83	58-137	
Xylene (Total)	ug/L	150	141	94	81-126	
1,2-Dichloroethane-d4 (S)	%			94	70-130	
4-Bromofluorobenzene (S)	%			106	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 1747002

Parameter	Units	92299484004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.5	102	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.2	106	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.4	102	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.1	105	70-130	
1,1-Dichloroethane	ug/L	ND	20	20.6	103	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.5	107	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	22.7	114	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.2	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.9	109	70-130	
1,2-Dichloropropane	ug/L	ND	20	19.1	95	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.6	108	70-130	
2-Butanone (MEK)	ug/L	ND	40	42.6	107	70-130	
2-Hexanone	ug/L	ND	40	39.2	98	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	37.7	94	70-130	
Acetone	ug/L	ND	40	47.0	117	70-130	
Acrylonitrile	ug/L	ND	100	107	107	70-130	
Benzene	ug/L	ND	20	21.1	106	70-148	
Bromochloromethane	ug/L	ND	20	19.5	97	70-130	
Bromodichloromethane	ug/L	ND	20	20.7	104	70-130	
Bromoform	ug/L	ND	20	19.6	98	70-130	
Bromomethane	ug/L	ND	20	14.2	71	70-130	
Carbon disulfide	ug/L	ND	20	18.5	93	70-130	
Carbon tetrachloride	ug/L	ND	20	21.1	106	70-130	
Chlorobenzene	ug/L	ND	20	21.0	105	70-146	
Chloroethane	ug/L	ND	20	21.6	108	70-130	
Chloroform	ug/L	ND	20	21.4	107	70-130	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

MATRIX SPIKE SAMPLE: 1747002

Parameter	Units	92299484004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	21.3	107	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.4	102	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.6	103	70-130	
Dibromochloromethane	ug/L	ND	20	20.7	103	70-130	
Dibromomethane	ug/L	ND	20	21.1	105	70-130	
Ethylbenzene	ug/L	ND	20	20.8	104	70-130	
Iodomethane	ug/L	ND	40	23.0	58	70-130	M1
Methylene Chloride	ug/L	ND	20	23.5	117	70-130	
Styrene	ug/L	ND	20	22.0	110	70-130	
Tetrachloroethene	ug/L	ND	20	19.6	98	70-130	
Toluene	ug/L	ND	20	21.0	105	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.8	109	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	20.4	102	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	17.2	86	70-130	
Trichloroethene	ug/L	ND	20	21.6	108	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.8	114	70-130	
Vinyl acetate	ug/L	ND	40	37.5	94	70-130	
Vinyl chloride	ug/L	ND	20	21.8	109	70-130	
1,2-Dichloroethane-d4 (S)	%				102	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				94	70-130	

SAMPLE DUPLICATE: 1747001

Parameter	Units	92299484003 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

SAMPLE DUPLICATE: 1747001

Parameter	Units	92299484003 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	107	106	1		
4-Bromofluorobenzene (S)	%	105	99	6		
Toluene-d8 (S)	%	101	102	1		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: WET/45274 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 1746416 | Matrix: Water
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	06/01/16 17:10	

LABORATORY CONTROL SAMPLE: 1746417

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	246	98	90-110	

SAMPLE DUPLICATE: 1746418

Parameter	Units	92299431001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	101	107	6	5	D6

SAMPLE DUPLICATE: 1746419

Parameter	Units	92299436003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-1 **Lab ID: 92299484001** Collected: 05/27/16 11:05 Received: 05/31/16 08:22 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.254 ± 0.291 (0.172)** **C:NA T:98%**	pCi/L	06/20/16 22:45	13982-63-3	
Radium-228	EPA 904.0	**-0.0467 ± 0.313 (0.740)** **C:77% T:85%**	pCi/L	06/17/16 16:07	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-1-FD **Lab ID: 92299484002** Collected: 05/27/16 11:20 Received: 05/31/16 08:22 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.427 (0.926)** **C:NA T:82%**	pCi/L	06/20/16 23:28	13982-63-3	
Radium-228	EPA 904.0	**0.431 ± 0.364 (0.730)** **C:75% T:86%**	pCi/L	06/17/16 16:08	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-2 **Lab ID: 92299484003** Collected: 05/27/16 13:40 Received: 05/31/16 08:22 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.690 ± 0.512 (0.641)** **C:NA T:89%**	pCi/L	06/20/16 23:22	13982-63-3	
Radium-228	EPA 904.0	**0.433 ± 0.352 (0.697)** **C:73% T:86%**	pCi/L	06/17/16 16:08	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: MW-3 **Lab ID: 92299484004** Collected: 05/27/16 15:05 Received: 05/31/16 08:22 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.24 ± 0.622 (0.508)** **C:NA T:93%**	pCi/L	06/20/16 23:11	13982-63-3	
Radium-228	EPA 904.0	**1.75 ± 0.540 (0.667)** **C:77% T:87%**	pCi/L	06/17/16 16:08	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: AMBIENT BLANK **Lab ID: 92299484005** Collected: 05/27/16 11:30 Received: 05/31/16 08:22 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.317 (0.511)** **C:NA T:92%**	pCi/L	06/20/16 23:40	13982-63-3	
Radium-228	EPA 904.0	**-0.131 ± 0.331 (0.797)** **C:75% T:87%**	pCi/L	06/17/16 16:08	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Sample: EQ. BLANK **Lab ID: 92299484006** Collected: 05/27/16 14:00 Received: 05/31/16 08:22 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.137 ± 0.313 (0.186) C:NA T:91%**	pCi/L	06/21/16 00:05	13982-63-3	
Radium-228	EPA 904.0	**0.226 ± 0.365 (0.793) C:74% T:79%**	pCi/L	06/17/16 16:08	15262-20-1	

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: RADC/29795 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 1087769 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.129 ± 0.342 (0.765) C:73% T:84%	pCi/L	06/17/16 16:05	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

QC Batch: RADC/29794 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92299484001, 92299484002, 92299484003, 92299484004, 92299484005, 92299484006

METHOD BLANK: 1087767 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.147 ± 0.353 (0.682) C:NA T:93%	pCi/L	06/20/16 22:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299484001	**MW-1**	EPA 300.0	GWD/3190		
92299484002	**MW-1-FD**	EPA 300.0	GWD/3190		
92299484003	**MW-2**	EPA 300.0	GWD/3190		
92299484004	**MW-3**	EPA 300.0	GWD/3190		
92299484005	**AMBIENT BLANK**	EPA 300.0	GWD/3190		
92299484006	**EQ. BLANK**	EPA 300.0	GWD/3190		
92299484001	**MW-1**	EPA 3010A	MPRP/21888	EPA 6010	ICP/19613
92299484002	**MW-1-FD**	EPA 3010A	MPRP/21888	EPA 6010	ICP/19613
92299484003	**MW-2**	EPA 3010A	MPRP/21888	EPA 6010	ICP/19613
92299484004	**MW-3**	EPA 3010A	MPRP/21888	EPA 6010	ICP/19613
92299484005	**AMBIENT BLANK**	EPA 3010A	MPRP/21888	EPA 6010	ICP/19613
92299484006	**EQ. BLANK**	EPA 3010A	MPRP/21888	EPA 6010	ICP/19613
92299484001	**MW-1**	EPA 3020	MPRP/63927	EPA 6020B	ICPM/29802
92299484002	**MW-1-FD**	EPA 3020	MPRP/63927	EPA 6020B	ICPM/29802
92299484003	**MW-2**	EPA 3020	MPRP/63927	EPA 6020B	ICPM/29802
92299484004	**MW-3**	EPA 3020	MPRP/63927	EPA 6020B	ICPM/29802
92299484005	**AMBIENT BLANK**	EPA 3020	MPRP/63927	EPA 6020B	ICPM/29802
92299484006	**EQ. BLANK**	EPA 3020	MPRP/63927	EPA 6020B	ICPM/29802
92299484001	**MW-1**	EPA 7470	MERP/9523	EPA 7470	MERC/9155
92299484002	**MW-1-FD**	EPA 7470	MERP/9523	EPA 7470	MERC/9155
92299484003	**MW-2**	EPA 7470	MERP/9523	EPA 7470	MERC/9155
92299484004	**MW-3**	EPA 7470	MERP/9523	EPA 7470	MERC/9155
92299484005	**AMBIENT BLANK**	EPA 7470	MERP/9523	EPA 7470	MERC/9155
92299484006	**EQ. BLANK**	EPA 7470	MERP/9523	EPA 7470	MERC/9155
92299484001	**MW-1**	EPA 8260	MSV/37110		
92299484002	**MW-1-FD**	EPA 8260	MSV/37110		
92299484003	**MW-2**	EPA 8260	MSV/37110		
92299484004	**MW-3**	EPA 8260	MSV/37110		
92299484005	**AMBIENT BLANK**	EPA 8260	MSV/37110		
92299484006	**EQ. BLANK**	EPA 8260	MSV/37110		
92299484007	**TRIP BLANK**	EPA 8260	MSV/37110		
92299484001	**MW-1**	EPA 903.1	RADC/29794		
92299484002	**MW-1-FD**	EPA 903.1	RADC/29794		
92299484003	**MW-2**	EPA 903.1	RADC/29794		
92299484004	**MW-3**	EPA 903.1	RADC/29794		
92299484005	**AMBIENT BLANK**	EPA 903.1	RADC/29794		
92299484006	**EQ. BLANK**	EPA 903.1	RADC/29794		
92299484001	**MW-1**	EPA 904.0	RADC/29795		
92299484002	**MW-1-FD**	EPA 904.0	RADC/29795		
92299484003	**MW-2**	EPA 904.0	RADC/29795		
92299484004	**MW-3**	EPA 904.0	RADC/29795		
92299484005	**AMBIENT BLANK**	EPA 904.0	RADC/29795		
92299484006	**EQ. BLANK**	EPA 904.0	RADC/29795		
92299484001	**MW-1**	SM 2540C	WET/45274		
92299484002	**MW-1-FD**	SM 2540C	WET/45274		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92299484

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92299484003	**MW-2**	SM 2540C	WET/45274		
92299484004	**MW-3**	SM 2540C	WET/45274		
92299484005	**AMBIENT BLANK**	SM 2540C	WET/45274		
92299484006	**EQ. BLANK**	SM 2540C	WET/45274		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised:April 25, 2016 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.19**	Issuing Authority: Pace Huntersville Quality Office

Sample Condition Upon Receipt

Client Name: Charrah

Project #: WO# : 92299484

92299484

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☑ None ☐ Other:____

Date/Initials Person Examining Contents: BV 5/31

Thermometer: T1505

Type of Ice: ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 2.5

Biological Tissue Frozen? ☐ Yes ☑ No ☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☑ No	☐ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNO3 pH<2; HCl pH<2; H2SO4 pH<2; NaOH pH>12; NaOH/ZnOAc pH>9
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	
Samples checked for dechlorination?	☐ Yes	☑ No	☐ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	12.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	13.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):____				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: ____ Date/Time: ____

Comments/Sample Discrepancy: ____

Project Manager SCURF Review: JY **Date:** 5/31/16

Project Manager SRF Review: JY **Date:** 5/31/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

2043531

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Charrah	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- ☐ NPDES
- ☑ GROUND WATER
- ☐ DRINKING WATER
- ☐ UST
- ☐ RCRA
- ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	RAD	8260	Metals	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92299494
1	MW-1		G			05/27/16	1105		11										3	3	2	1	1	1		001
2	MW-1-FD		G			05/27/16	1120		11										3	3	2	1	1	1		002
3	MW-2		G			05/27/16	1340		11										3	3	2	1	1	1		003
4	MW-3		G			05/27/16	1505		11										3	3	2	1	1	1		004
5	Trip Blank		G			05/27/16	0800		2											2						-007
6	Ambient Blank		G			05/27/16	1130		11										3	3	2	1	1	1		005
7	EQ. Blank		G			05/27/16	1400		11										3	3	2	1	1	1		006
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	05/27/16	1700	Chuck Foster Pace	5/31/16	08:22				
	Chuck Foster Pace	5/31/16	011:30	[illegible]	5/31	11:30	2.5	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 05/27/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 05, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on July 12, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

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CERTIFICATIONS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92304768001	**MW-7**	Water	07/11/16 09:55	07/12/16 12:45
92304768002	**MW-6**	Water	07/11/16 12:40	07/12/16 12:45
92304768003	**MW-5**	Water	07/11/16 14:10	07/12/16 12:45
92304768004	**LEACHATE-1**	Water	07/11/16 14:15	07/12/16 12:45
92304768005	**MW-3**	Water	07/11/16 15:55	07/12/16 12:45
92304768006	**AMBIENT BLANK**	Water	07/11/16 14:30	07/12/16 12:45
92304768007	**EQ BLANK**	Water	07/11/16 16:00	07/12/16 12:45
92304768008	**TRIP BLANK**	Water	07/11/16 08:00	07/12/16 12:45

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92304768001	**MW-7**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768002	**MW-6**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768003	**MW-5**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768004	**LEACHATE-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768005	**MW-3**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768006	**AMBIENT BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768007	**EQ BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	NB	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304768008	**TRIP BLANK**	EPA 8260	NB	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304768001	**MW-7**					
EPA 300.0	Chloride	382	mg/L	8.0	07/14/16 15:38	M6
EPA 300.0	Fluoride	0.21	mg/L	0.10	07/14/16 12:19	
EPA 300.0	Sulfate	11.2	mg/L	1.0	07/14/16 12:19	
EPA 6010	Barium	224	ug/L	5.0	07/18/16 17:35	
EPA 6010	Calcium	53200	ug/L	100	07/18/16 17:35	
EPA 6020B	Boron	22.7	ug/L	5.0	07/18/16 10:55	
EPA 6020B	Lithium	23.0	ug/L	0.50	07/18/16 10:55	
EPA 903.1	Radium-226	0.000 ± 0.396 (0.888) C:NA T:99%	pCi/L		08/05/16 12:45	
EPA 904.0	Radium-228	0.0190 ± 0.264 (0.594) C:84% T:88%	pCi/L		08/03/16 21:15	
SM 2540C	Total Dissolved Solids	1100	mg/L	125	07/14/16 15:09	
92304768002	**MW-6**					
EPA 300.0	Chloride	239	mg/L	5.0	07/14/16 17:46	
EPA 300.0	Fluoride	0.31	mg/L	0.10	07/14/16 13:25	
EPA 300.0	Sulfate	53.8	mg/L	1.0	07/14/16 13:25	
EPA 6010	Barium	89.8	ug/L	5.0	07/18/16 17:54	
EPA 6010	Calcium	35400	ug/L	100	07/18/16 17:54	
EPA 6010	Zinc	11.8	ug/L	10.0	07/18/16 17:54	
EPA 6020B	Boron	7.7	ug/L	5.0	07/18/16 10:29	
EPA 6020B	Lithium	31.7	ug/L	0.50	07/18/16 10:29	
EPA 903.1	Radium-226	0.393 ± 0.590 (0.975) C:NA T:91%	pCi/L		08/05/16 12:53	
EPA 904.0	Radium-228	0.907 ± 0.432 (0.751) C:78% T:91%	pCi/L		08/03/16 21:15	
SM 2540C	Total Dissolved Solids	660	mg/L	25.0	07/14/16 15:09	
92304768003	**MW-5**					
EPA 300.0	Chloride	17.6	mg/L	1.0	07/14/16 13:47	
EPA 300.0	Fluoride	0.50	mg/L	0.10	07/14/16 13:47	
EPA 300.0	Sulfate	2.6	mg/L	1.0	07/14/16 13:47	
EPA 6010	Barium	93.0	ug/L	5.0	07/18/16 17:57	
EPA 6010	Calcium	9990	ug/L	100	07/18/16 17:57	
EPA 6010	Zinc	21.2	ug/L	10.0	07/18/16 17:57	
EPA 6020B	Boron	9.8	ug/L	5.0	07/18/16 10:33	
EPA 6020B	Lithium	9.3	ug/L	0.50	07/18/16 10:33	
EPA 903.1	Radium-226	-0.092 ± 0.419 (0.853) C:NA T:94%	pCi/L		08/05/16 13:12	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304768003	**MW-5**					
EPA 904.0	Radium-228	0.568 ± 0.368 (0.690) C:78% T:85%	pCi/L		08/03/16 21:15	
SM 2540C	Total Dissolved Solids	221	mg/L	25.0	07/14/16 15:09	
92304768004	**LEACHATE-1**					
EPA 300.0	Chloride	6.0	mg/L	1.0	07/14/16 14:09	
EPA 300.0	Fluoride	0.15	mg/L	0.10	07/14/16 14:09	
EPA 300.0	Sulfate	276	mg/L	6.0	07/14/16 18:14	
EPA 6010	Antimony	5.7	ug/L	5.0	07/18/16 18:00	
EPA 6010	Arsenic	16.0	ug/L	10.0	07/18/16 18:00	
EPA 6010	Barium	144	ug/L	5.0	07/18/16 18:00	
EPA 6010	Calcium	156000	ug/L	1000	07/19/16 11:36	
EPA 6010	Molybdenum	191	ug/L	5.0	07/18/16 18:00	
EPA 6010	Selenium	27.2	ug/L	10.0	07/18/16 18:00	
EPA 6010	Vanadium	20.5	ug/L	5.0	07/18/16 18:00	
EPA 6020B	Boron	1150	ug/L	50.0	07/19/16 15:27	
EPA 6020B	Lithium	61.8	ug/L	0.50	07/18/16 10:38	
EPA 903.1	Radium-226	-0.087 ± 0.464 (0.962) C:NA T:84%	pCi/L		08/05/16 12:57	
EPA 904.0	Radium-228	0.151 ± 0.440 (0.958) C:78% T:68%	pCi/L		08/03/16 21:15	
SM 2540C	Total Dissolved Solids	711	mg/L	25.0	07/14/16 15:10	
92304768005	**MW-3**					
EPA 300.0	Chloride	1190	mg/L	20.0	07/14/16 18:42	
EPA 300.0	Fluoride	0.26	mg/L	0.10	07/14/16 14:32	
EPA 300.0	Sulfate	125	mg/L	20.0	07/14/16 18:42	
EPA 6010	Antimony	11.4	ug/L	5.0	07/18/16 18:03	
EPA 6010	Barium	728	ug/L	5.0	07/18/16 18:03	
EPA 6010	Calcium	182000	ug/L	1000	07/19/16 11:39	
EPA 6010	Molybdenum	12.0	ug/L	5.0	07/18/16 18:03	
EPA 6020B	Boron	41.9	ug/L	5.0	07/18/16 10:42	
EPA 6020B	Lithium	73.2	ug/L	0.50	07/18/16 10:42	
EPA 903.1	Radium-226	0.308 ± 0.620 (0.997) C:NA T:93%	pCi/L		08/05/16 12:30	
EPA 904.0	Radium-228	0.801 ± 0.385 (0.658) C:82% T:85%	pCi/L		08/03/16 21:15	
SM 2540C	Total Dissolved Solids	2440	mg/L	250	07/14/16 15:10	

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SUMMARY OF DETECTION

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304768006	**AMBIENT BLANK**					
EPA 6020B	Boron	6.4	ug/L	5.0	07/18/16 10:46	
EPA 8260	Acetone	37.3	ug/L	25.0	07/14/16 04:32	
EPA 8260	2-Butanone (MEK)	9.7	ug/L	5.0	07/14/16 04:32	
EPA 903.1	Radium-226	-0.240 ± 0.465 (0.989) C:NA T:97%	pCi/L		08/05/16 13:09	
EPA 904.0	Radium-228	0.187 ± 0.290 (0.613) C:82% T:89%	pCi/L		08/03/16 21:15	
SM 2540C	Total Dissolved Solids	26.0	mg/L	25.0	07/14/16 15:10	
92304768007	**EQ BLANK**					
EPA 903.1	Radium-226	0.483 ± 0.502 (0.748) C:NA T:95%	pCi/L		08/05/16 13:26	
EPA 904.0	Radium-228	0.448 ± 0.355 (0.694) C:79% T:85%	pCi/L		08/03/16 21:15	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-7 **Lab ID: 92304768001** Collected: 07/11/16 09:55 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**382**	mg/L	8.0	8		07/14/16 15:38	16887-00-6	M6
Fluoride	**0.21**	mg/L	0.10	1		07/14/16 12:19	16984-48-8	
Sulfate	**11.2**	mg/L	1.0	1		07/14/16 12:19	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:35	7440-38-2	
Barium	**224**	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 17:35	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 17:35	7440-43-9	
Calcium	**53200**	ug/L	100	1	07/14/16 19:50	07/18/16 17:35	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:35	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 17:35	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:35	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:35	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**22.7**	ug/L	5.0	1	07/15/16 09:40	07/18/16 10:55	7440-42-8	
Lithium	**23.0**	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:55	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:17	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 02:49	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 02:49	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 02:49	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 02:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 02:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 02:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 02:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 02:49	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 02:49	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 02:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 02:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 02:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 02:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 02:49	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 02:49	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-7 **Lab ID: 92304768001** Collected: 07/11/16 09:55 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 02:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 02:49	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 02:49	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 02:49	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 02:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 02:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 02:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 02:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 02:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 02:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 02:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 02:49	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 02:49	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 02:49	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 02:49	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 02:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 02:49	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 02:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 02:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 02:49	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 02:49	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 02:49	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 02:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 02:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 02:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 02:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 02:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 02:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 02:49	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 02:49	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		07/14/16 02:49	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		07/14/16 02:49	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/14/16 02:49	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1100**	mg/L	125	1		07/14/16 15:09		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-6 **Lab ID: 92304768002** Collected: 07/11/16 12:40 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**239**	mg/L	5.0	5		07/14/16 17:46	16887-00-6	
Fluoride	**0.31**	mg/L	0.10	1		07/14/16 13:25	16984-48-8	
Sulfate	**53.8**	mg/L	1.0	1		07/14/16 13:25	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:54	7440-38-2	
Barium	**89.8**	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 17:54	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 17:54	7440-43-9	
Calcium	**35400**	ug/L	100	1	07/14/16 19:50	07/18/16 17:54	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:54	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 17:54	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:54	7440-62-2	
Zinc	**11.8**	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:54	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**7.7**	ug/L	5.0	1	07/15/16 09:40	07/18/16 10:29	7440-42-8	
Lithium	**31.7**	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:29	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:20	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 03:06	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 03:06	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 03:06	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 03:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 03:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 03:06	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 03:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 03:06	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 03:06	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 03:06	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 03:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 03:06	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 03:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 03:06	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 03:06	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-6 **Lab ID: 92304768002** Collected: 07/11/16 12:40 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 03:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 03:06	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 03:06	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 03:06	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 03:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 03:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 03:06	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 03:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 03:06	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 03:06	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 03:06	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 03:06	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 03:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 03:06	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 03:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 03:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 03:06	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 03:06	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 03:06	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 03:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 03:06	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 03:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 03:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 03:06	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 03:06	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 03:06	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 03:06	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		07/14/16 03:06	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		07/14/16 03:06	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		07/14/16 03:06	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**660**	mg/L	25.0	1		07/14/16 15:09		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-5 **Lab ID: 92304768003** Collected: 07/11/16 14:10 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**17.6**	mg/L	1.0	1		07/14/16 13:47	16887-00-6	
Fluoride	**0.50**	mg/L	0.10	1		07/14/16 13:47	16984-48-8	
Sulfate	**2.6**	mg/L	1.0	1		07/14/16 13:47	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:57	7440-38-2	
Barium	**93.0**	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 17:57	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 17:57	7440-43-9	
Calcium	**9990**	ug/L	100	1	07/14/16 19:50	07/18/16 17:57	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:57	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 17:57	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 17:57	7440-62-2	
Zinc	**21.2**	ug/L	10.0	1	07/14/16 19:50	07/18/16 17:57	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.8**	ug/L	5.0	1	07/15/16 09:40	07/18/16 10:33	7440-42-8	
Lithium	**9.3**	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:33	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:36	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 03:41	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 03:41	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 03:41	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 03:41	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 03:41	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 03:41	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 03:41	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 03:41	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 03:41	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 03:41	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 03:41	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 03:41	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 03:41	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 03:41	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 03:41	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-5 **Lab ID: 92304768003** Collected: 07/11/16 14:10 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 03:41	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 03:41	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 03:41	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 03:41	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 03:41	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 03:41	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:41	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:41	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:41	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 03:41	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 03:41	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 03:41	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 03:41	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 03:41	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 03:41	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 03:41	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 03:41	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 03:41	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 03:41	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 03:41	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 03:41	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 03:41	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 03:41	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 03:41	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 03:41	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 03:41	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 03:41	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 03:41	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 03:41	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 03:41	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		07/14/16 03:41	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		07/14/16 03:41	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/14/16 03:41	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**221**	mg/L	25.0	1		07/14/16 15:09		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: LEACHATE-1 **Lab ID: 92304768004** Collected: 07/11/16 14:15 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**6.0**	mg/L	1.0	1		07/14/16 14:09	16887-00-6	
Fluoride	**0.15**	mg/L	0.10	1		07/14/16 14:09	16984-48-8	
Sulfate	**276**	mg/L	6.0	6		07/14/16 18:14	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**5.7**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-36-0	
Arsenic	**16.0**	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:00	7440-38-2	
Barium	**144**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:00	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:00	7440-43-9	
Calcium	**156000**	ug/L	1000	10	07/14/16 19:50	07/19/16 11:36	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7439-92-1	
Molybdenum	**191**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-02-0	
Selenium	**27.2**	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:00	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 18:00	7440-28-0	
Vanadium	**20.5**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:00	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:00	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**1150**	ug/L	50.0	10	07/15/16 09:40	07/19/16 15:27	7440-42-8	
Lithium	**61.8**	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:38	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:44	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 03:58	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 03:58	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 03:58	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 03:58	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 03:58	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 03:58	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 03:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 03:58	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 03:58	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 03:58	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 03:58	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 03:58	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 03:58	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 03:58	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 03:58	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: LEACHATE-1 **Lab ID: 92304768004** Collected: 07/11/16 14:15 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 03:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 03:58	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 03:58	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 03:58	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 03:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 03:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 03:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 03:58	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 03:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 03:58	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 03:58	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 03:58	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 03:58	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 03:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 03:58	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 03:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 03:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 03:58	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 03:58	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 03:58	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 03:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 03:58	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 03:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 03:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 03:58	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 03:58	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 03:58	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 03:58	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		07/14/16 03:58	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		07/14/16 03:58	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		07/14/16 03:58	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**711**	mg/L	25.0	1		07/14/16 15:10		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-3 **Lab ID: 92304768005** Collected: 07/11/16 15:55 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1190**	mg/L	20.0	20		07/14/16 18:42	16887-00-6	
Fluoride	**0.26**	mg/L	0.10	1		07/14/16 14:32	16984-48-8	
Sulfate	**125**	mg/L	20.0	20		07/14/16 18:42	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**11.4**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:03	7440-38-2	
Barium	**728**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:03	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:03	7440-43-9	
Calcium	**182000**	ug/L	1000	10	07/14/16 19:50	07/19/16 11:39	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7439-92-1	
Molybdenum	**12.0**	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:03	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 18:03	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:03	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:03	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**41.9**	ug/L	5.0	1	07/15/16 09:40	07/18/16 10:42	7440-42-8	
Lithium	**73.2**	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:42	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:46	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 04:15	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 04:15	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 04:15	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 04:15	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 04:15	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 04:15	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 04:15	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 04:15	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 04:15	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 04:15	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 04:15	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 04:15	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 04:15	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 04:15	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 04:15	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-3 **Lab ID: 92304768005** Collected: 07/11/16 15:55 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 04:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 04:15	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 04:15	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 04:15	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 04:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 04:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 04:15	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 04:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 04:15	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 04:15	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 04:15	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 04:15	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 04:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 04:15	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 04:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 04:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 04:15	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 04:15	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 04:15	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 04:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 04:15	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 04:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 04:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 04:15	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 04:15	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 04:15	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 04:15	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		07/14/16 04:15	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		07/14/16 04:15	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/14/16 04:15	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2440**	mg/L	250	1		07/14/16 15:10		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: AMBIENT BLANK **Lab ID: 92304768006** Collected: 07/11/16 14:30 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		07/14/16 14:54	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/14/16 14:54	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/14/16 14:54	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:06	7440-38-2	
Barium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:06	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:06	7440-43-9	
Calcium	ND	ug/L	100	1	07/14/16 19:50	07/18/16 18:06	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:06	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 18:06	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:06	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:06	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.4**	ug/L	5.0	1	07/15/16 09:40	07/18/16 10:46	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:46	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:48	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	**37.3**	ug/L	25.0	1		07/14/16 04:32	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 04:32	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 04:32	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 04:32	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 04:32	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 04:32	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 04:32	74-83-9	
2-Butanone (MEK)	**9.7**	ug/L	5.0	1		07/14/16 04:32	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 04:32	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 04:32	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 04:32	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 04:32	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 04:32	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 04:32	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 04:32	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: AMBIENT BLANK **Lab ID: 92304768006** Collected: 07/11/16 14:30 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 04:32	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 04:32	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 04:32	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 04:32	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 04:32	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 04:32	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:32	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:32	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:32	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 04:32	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 04:32	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 04:32	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 04:32	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 04:32	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 04:32	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 04:32	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 04:32	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 04:32	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 04:32	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 04:32	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 04:32	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 04:32	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 04:32	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 04:32	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 04:32	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 04:32	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 04:32	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 04:32	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 04:32	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 04:32	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		07/14/16 04:32	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		07/14/16 04:32	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/14/16 04:32	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26.0**	mg/L	25.0	1		07/14/16 15:10		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: EQ BLANK **Lab ID: 92304768007** Collected: 07/11/16 16:00 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		07/14/16 15:16	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/14/16 15:16	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/14/16 15:16	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:09	7440-38-2	
Barium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/14/16 19:50	07/18/16 18:09	7440-43-9	
Calcium	ND	ug/L	100	1	07/14/16 19:50	07/18/16 18:09	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-48-4	
Copper	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-50-8	
Lead	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:09	7782-49-2	
Silver	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/14/16 19:50	07/18/16 18:09	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/14/16 19:50	07/18/16 18:09	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/14/16 19:50	07/18/16 18:09	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	07/15/16 09:40	07/18/16 10:51	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/15/16 09:40	07/18/16 10:51	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 06:35	07/16/16 05:51	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 04:49	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 04:49	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 04:49	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 04:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 04:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 04:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 04:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 04:49	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 04:49	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 04:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 04:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 04:49	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 04:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 04:49	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 04:49	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: EQ BLANK **Lab ID: 92304768007** Collected: 07/11/16 16:00 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/14/16 04:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 04:49	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 04:49	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 04:49	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 04:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 04:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:49	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 04:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 04:49	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 04:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 04:49	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 04:49	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 04:49	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 04:49	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 04:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 04:49	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 04:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 04:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 04:49	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 04:49	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 04:49	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 04:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 04:49	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 04:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 04:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 04:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 04:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 04:49	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 04:49	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		07/14/16 04:49	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		07/14/16 04:49	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		07/14/16 04:49	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		07/14/16 15:12		

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: TRIP BLANK **Lab ID: 92304768008** Collected: 07/11/16 08:00 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/14/16 05:06	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/14/16 05:06	107-13-1	
Benzene	ND	ug/L	1.0	1		07/14/16 05:06	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/14/16 05:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/14/16 05:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/14/16 05:06	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/14/16 05:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/14/16 05:06	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/14/16 05:06	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/14/16 05:06	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/14/16 05:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/14/16 05:06	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/14/16 05:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/14/16 05:06	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/14/16 05:06	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/14/16 05:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 05:06	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/14/16 05:06	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/14/16 05:06	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/14/16 05:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/14/16 05:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/14/16 05:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 05:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/14/16 05:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/14/16 05:06	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 05:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/14/16 05:06	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/14/16 05:06	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/14/16 05:06	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/14/16 05:06	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/14/16 05:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/14/16 05:06	108-10-1	
Styrene	ND	ug/L	1.0	1		07/14/16 05:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 05:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/14/16 05:06	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/14/16 05:06	127-18-4	
Toluene	ND	ug/L	1.0	1		07/14/16 05:06	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/14/16 05:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/14/16 05:06	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/14/16 05:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/14/16 05:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/14/16 05:06	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/14/16 05:06	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/14/16 05:06	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/14/16 05:06	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		07/14/16 05:06	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: TRIP BLANK **Lab ID: 92304768008** Collected: 07/11/16 08:00 Received: 07/12/16 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%	70-130	1		07/14/16 05:06	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		07/14/16 05:06	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 321171 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 1779748 | Matrix: Water
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/14/16 11:35	
Fluoride	mg/L	ND	0.10	07/14/16 11:35	
Sulfate	mg/L	ND	1.0	07/14/16 11:35	

LABORATORY CONTROL SAMPLE: 1779749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	52.7	105	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	
Sulfate	mg/L	50	52.0	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1779750 1779751

Parameter	Units	92304768001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	382	50	50	423	427	82	89	90-110	1	20	M6
Fluoride	mg/L	0.21	2.5	2.5	2.6	2.7	94	99	90-110	4	20	
Sulfate	mg/L	11.2	50	50	60.8	62.7	99	103	90-110	3	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 321122 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92304768001, 92304768002

METHOD BLANK: 1779552 | Matrix: Water
Associated Lab Samples: 92304768001, 92304768002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/16/16 04:13	

LABORATORY CONTROL SAMPLE: 1779553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1779554 1779555

Parameter	Units	92304661001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.0	2.0	77	78	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 321123 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 1779556 | Matrix: Water
Associated Lab Samples: 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/16/16 05:22	

LABORATORY CONTROL SAMPLE: 1779557

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.3	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1779558 1779559

Parameter	Units	92304768003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.4	95	96	75-125	1	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 321105 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 1779512 | Matrix: Water
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/18/16 17:29	
Arsenic	ug/L	ND	10.0	07/18/16 17:29	
Barium	ug/L	ND	5.0	07/18/16 17:29	
Beryllium	ug/L	ND	1.0	07/18/16 17:29	
Cadmium	ug/L	ND	1.0	07/18/16 17:29	
Calcium	ug/L	ND	100	07/18/16 17:29	
Chromium	ug/L	ND	5.0	07/18/16 17:29	
Cobalt	ug/L	ND	5.0	07/18/16 17:29	
Copper	ug/L	ND	5.0	07/18/16 17:29	
Lead	ug/L	ND	5.0	07/18/16 17:29	
Molybdenum	ug/L	ND	5.0	07/18/16 17:29	
Nickel	ug/L	ND	5.0	07/18/16 17:29	
Selenium	ug/L	ND	10.0	07/18/16 17:29	
Silver	ug/L	ND	5.0	07/18/16 17:29	
Thallium	ug/L	ND	5.4	07/18/16 17:29	
Vanadium	ug/L	ND	5.0	07/18/16 17:29	
Zinc	ug/L	ND	10.0	07/18/16 17:29	

LABORATORY CONTROL SAMPLE: 1779513

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	526	105	80-120	
Arsenic	ug/L	500	497	99	80-120	
Barium	ug/L	500	515	103	80-120	
Beryllium	ug/L	500	506	101	80-120	
Cadmium	ug/L	500	519	104	80-120	
Calcium	ug/L	5000	5130	103	80-120	
Chromium	ug/L	500	508	102	80-120	
Cobalt	ug/L	500	511	102	80-120	
Copper	ug/L	500	520	104	80-120	
Lead	ug/L	500	507	101	80-120	
Molybdenum	ug/L	500	544	109	80-120	
Nickel	ug/L	500	515	103	80-120	
Selenium	ug/L	500	514	103	80-120	
Silver	ug/L	250	260	104	80-120	
Thallium	ug/L	500	482	96	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	499	100	80-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1779514 1779515

Parameter	Units	92304768001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	512	527	102	105	75-125	3	25	
Arsenic	ug/L	ND	500	500	491	502	98	100	75-125	2	25	
Barium	ug/L	224	500	500	716	731	99	101	75-125	2	25	
Beryllium	ug/L	ND	500	500	488	503	98	101	75-125	3	25	
Cadmium	ug/L	ND	500	500	500	514	100	103	75-125	3	25	
Calcium	ug/L	53200	5000	5000	58800	59000	112	117	75-125	0	25	
Chromium	ug/L	ND	500	500	485	498	97	99	75-125	3	25	
Cobalt	ug/L	ND	500	500	471	483	94	97	75-125	3	25	
Copper	ug/L	ND	500	500	502	516	100	103	75-125	3	25	
Lead	ug/L	ND	500	500	462	476	92	95	75-125	3	25	
Molybdenum	ug/L	ND	500	500	529	543	105	108	75-125	3	25	
Nickel	ug/L	ND	500	500	475	487	95	97	75-125	2	25	
Selenium	ug/L	ND	500	500	495	507	99	101	75-125	2	25	
Silver	ug/L	ND	250	250	251	257	100	103	75-125	3	25	
Thallium	ug/L	ND	500	500	427	441	85	88	75-125	3	25	
Vanadium	ug/L	ND	500	500	496	511	99	102	75-125	3	25	
Zinc	ug/L	ND	500	500	480	498	94	98	75-125	4	25	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 425502 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 | Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 2317348 | Matrix: Water
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	07/18/16 10:10	
Lithium	ug/L	ND	0.50	07/18/16 10:10	

LABORATORY CONTROL SAMPLE: 2317349

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	99.9	100	80-120	
Lithium	ug/L	100	105	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2317350 2317351

Parameter	Units	92304768001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	22.7	100	100	125	130	102	107	75-125	4	20	
Lithium	ug/L	23.0	100	100	121	126	98	103	75-125	4	20	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 321048 | Analysis Method: EPA 8260
QC Batch Method: EPA 8260 | Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007, 92304768008

METHOD BLANK: 1779147 | Matrix: Water
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007, 92304768008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	07/14/16 02:32	
1,1,1-Trichloroethane	ug/L	ND	1.0	07/14/16 02:32	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	07/14/16 02:32	
1,1,2-Trichloroethane	ug/L	ND	1.0	07/14/16 02:32	
1,1-Dichloroethane	ug/L	ND	1.0	07/14/16 02:32	
1,1-Dichloroethene	ug/L	ND	1.0	07/14/16 02:32	
1,2,3-Trichloropropane	ug/L	ND	1.0	07/14/16 02:32	
1,2-Dichlorobenzene	ug/L	ND	1.0	07/14/16 02:32	
1,2-Dichloroethane	ug/L	ND	1.0	07/14/16 02:32	
1,2-Dichloropropane	ug/L	ND	1.0	07/14/16 02:32	
1,4-Dichlorobenzene	ug/L	ND	1.0	07/14/16 02:32	
2-Butanone (MEK)	ug/L	ND	5.0	07/14/16 02:32	
2-Hexanone	ug/L	ND	5.0	07/14/16 02:32	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	07/14/16 02:32	
Acetone	ug/L	ND	25.0	07/14/16 02:32	
Acrylonitrile	ug/L	ND	10.0	07/14/16 02:32	
Benzene	ug/L	ND	1.0	07/14/16 02:32	
Bromochloromethane	ug/L	ND	1.0	07/14/16 02:32	
Bromodichloromethane	ug/L	ND	1.0	07/14/16 02:32	
Bromoform	ug/L	ND	1.0	07/14/16 02:32	
Bromomethane	ug/L	ND	2.0	07/14/16 02:32	
Carbon disulfide	ug/L	ND	2.0	07/14/16 02:32	
Carbon tetrachloride	ug/L	ND	1.0	07/14/16 02:32	
Chlorobenzene	ug/L	ND	1.0	07/14/16 02:32	
Chloroethane	ug/L	ND	1.0	07/14/16 02:32	
Chloroform	ug/L	ND	1.0	07/14/16 02:32	
Chloromethane	ug/L	ND	1.0	07/14/16 02:32	
cis-1,2-Dichloroethene	ug/L	ND	1.0	07/14/16 02:32	
cis-1,3-Dichloropropene	ug/L	ND	1.0	07/14/16 02:32	
Dibromochloromethane	ug/L	ND	1.0	07/14/16 02:32	
Dibromomethane	ug/L	ND	1.0	07/14/16 02:32	
Ethylbenzene	ug/L	ND	1.0	07/14/16 02:32	
Iodomethane	ug/L	ND	5.0	07/14/16 02:32	
Methylene Chloride	ug/L	ND	1.0	07/14/16 02:32	
Styrene	ug/L	ND	1.0	07/14/16 02:32	
Tetrachloroethene	ug/L	ND	1.0	07/14/16 02:32	
Toluene	ug/L	ND	1.0	07/14/16 02:32	
trans-1,2-Dichloroethene	ug/L	ND	1.0	07/14/16 02:32	
trans-1,3-Dichloropropene	ug/L	ND	1.0	07/14/16 02:32	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	07/14/16 02:32	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

METHOD BLANK: 1779147 Matrix: Water

Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007, 92304768008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	07/14/16 02:32	
Trichlorofluoromethane	ug/L	ND	1.0	07/14/16 02:32	
Vinyl acetate	ug/L	ND	2.0	07/14/16 02:32	
Vinyl chloride	ug/L	ND	1.0	07/14/16 02:32	
Xylene (Total)	ug/L	ND	1.0	07/14/16 02:32	
1,2-Dichloroethane-d4 (S)	%	101	70-130	07/14/16 02:32	
4-Bromofluorobenzene (S)	%	99	70-130	07/14/16 02:32	
Toluene-d8 (S)	%	100	70-130	07/14/16 02:32	

LABORATORY CONTROL SAMPLE: 1779148

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.4	97	80-125	
1,1,1-Trichloroethane	ug/L	50	48.1	96	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	46.5	93	79-124	
1,1,2-Trichloroethane	ug/L	50	46.5	93	85-125	
1,1-Dichloroethane	ug/L	50	46.8	94	73-126	
1,1-Dichloroethene	ug/L	50	48.5	97	66-135	
1,2,3-Trichloropropane	ug/L	50	45.9	92	75-130	
1,2-Dichlorobenzene	ug/L	50	50.8	102	80-133	
1,2-Dichloroethane	ug/L	50	46.1	92	67-128	
1,2-Dichloropropane	ug/L	50	45.7	91	75-132	
1,4-Dichlorobenzene	ug/L	50	48.4	97	78-130	
2-Butanone (MEK)	ug/L	100	95.1	95	61-144	
2-Hexanone	ug/L	100	98.3	98	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	96.7	97	72-135	
Acetone	ug/L	100	96.9	97	48-146	
Acrylonitrile	ug/L	250	250	100	40-160	
Benzene	ug/L	50	47.5	95	80-125	
Bromochloromethane	ug/L	50	49.1	98	71-125	
Bromodichloromethane	ug/L	50	48.5	97	78-124	
Bromoform	ug/L	50	42.6	85	71-128	
Bromomethane	ug/L	50	52.6	105	40-160	
Carbon disulfide	ug/L	50	52.8	106	50-160	
Carbon tetrachloride	ug/L	50	48.8	98	69-131	
Chlorobenzene	ug/L	50	48.8	98	81-122	
Chloroethane	ug/L	50	49.6	99	39-148	
Chloroform	ug/L	50	46.8	94	73-127	
Chloromethane	ug/L	50	53.9	108	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.7	95	74-124	
cis-1,3-Dichloropropene	ug/L	50	46.7	93	72-132	
Dibromochloromethane	ug/L	50	48.3	97	78-125	
Dibromomethane	ug/L	50	48.4	97	82-120	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

LABORATORY CONTROL SAMPLE: 1779148

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	47.4	95	79-121	
Iodomethane	ug/L	100	106	106	39-154	
Methylene Chloride	ug/L	50	46.8	94	64-133	
Styrene	ug/L	50	50.1	100	84-126	
Tetrachloroethene	ug/L	50	44.0	88	78-122	
Toluene	ug/L	50	47.7	95	80-121	
trans-1,2-Dichloroethene	ug/L	50	48.4	97	71-127	
trans-1,3-Dichloropropene	ug/L	50	46.2	92	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	60.4	121	40-160	
Trichloroethene	ug/L	50	46.5	93	78-122	
Trichlorofluoromethane	ug/L	50	52.2	104	53-137	
Vinyl acetate	ug/L	100	89.1	89	40-160	
Vinyl chloride	ug/L	50	49.6	99	58-137	
Xylene (Total)	ug/L	150	140	93	81-126	
1,2-Dichloroethane-d4 (S)	%			100	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE SAMPLE: 1779149

Parameter	Units	92304768001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20.0	100	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	21.0	105	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.1	96	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	19.3	97	70-130	
1,1-Dichloroethane	ug/L	ND	20	20.5	103	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.5	107	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.0	95	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	20.8	104	70-130	
1,2-Dichloroethane	ug/L	ND	20	19.4	97	70-130	
1,2-Dichloropropane	ug/L	ND	20	19.5	98	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.1	100	70-130	
2-Butanone (MEK)	ug/L	ND	40	38.0	95	70-130	
2-Hexanone	ug/L	ND	40	38.9	97	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	38.9	97	70-130	
Acetone	ug/L	ND	40	40.2	101	70-130	
Acrylonitrile	ug/L	ND	100	102	102	70-130	
Benzene	ug/L	ND	20	20.2	101	70-148	
Bromochloromethane	ug/L	ND	20	21.0	105	70-130	
Bromodichloromethane	ug/L	ND	20	20.1	100	70-130	
Bromoform	ug/L	ND	20	17.7	89	70-130	
Bromomethane	ug/L	ND	20	19.5	98	70-130	
Carbon disulfide	ug/L	ND	20	18.5	93	70-130	
Carbon tetrachloride	ug/L	ND	20	21.8	109	70-130	
Chlorobenzene	ug/L	ND	20	21.0	105	70-146	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

MATRIX SPIKE SAMPLE: 1779149

Parameter	Units	92304768001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	22.7	113	70-130	
Chloroform	ug/L	ND	20	20.1	101	70-130	
Chloromethane	ug/L	ND	20	22.9	114	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	20.6	103	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	18.8	94	70-130	
Dibromochloromethane	ug/L	ND	20	20.1	100	70-130	
Dibromomethane	ug/L	ND	20	19.9	99	70-130	
Ethylbenzene	ug/L	ND	20	20.6	103	70-130	
Iodomethane	ug/L	ND	40	29.2	73	70-130	
Methylene Chloride	ug/L	ND	20	19.3	96	70-130	
Styrene	ug/L	ND	20	20.9	104	70-130	
Tetrachloroethene	ug/L	ND	20	18.9	95	70-130	
Toluene	ug/L	ND	20	20.5	102	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.3	107	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.3	92	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	17.3	87	70-130	
Trichloroethene	ug/L	ND	20	19.9	100	69-151	
Trichlorofluoromethane	ug/L	ND	20	24.5	122	70-130	
Vinyl acetate	ug/L	ND	40	29.3	73	70-130	
Vinyl chloride	ug/L	ND	20	22.7	113	70-130	
1,2-Dichloroethane-d4 (S)	%				100	70-130	
4-Bromofluorobenzene (S)	%				101	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1779150

Parameter	Units	92304768002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

SAMPLE DUPLICATE: 1779150

Parameter	Units	92304768002 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	102	102	0		
4-Bromofluorobenzene (S)	%	100	97	2		
Toluene-d8 (S)	%	99	100	0		

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QUALITY CONTROL DATA

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 321217 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 1780091 | Matrix: Water
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/14/16 15:07	

LABORATORY CONTROL SAMPLE: 1780092

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	248	99	90-110	

SAMPLE DUPLICATE: 1780093

Parameter	Units	92304669001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1130	8020	151	5	D6

SAMPLE DUPLICATE: 1780094

Parameter	Units	92304660001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3600	4580	24	5	D6

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-7 **Lab ID: 92304768001** Collected: 07/11/16 09:55 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.396 (0.888)** **C:NA T:99%**	pCi/L	08/05/16 12:45	13982-63-3	
Radium-228	EPA 904.0	**0.0190 ± 0.264 (0.594)** **C:84% T:88%**	pCi/L	08/03/16 21:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-6 **Lab ID: 92304768002** Collected: 07/11/16 12:40 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.393 ± 0.590 (0.975)** **C:NA T:91%**	pCi/L	08/05/16 12:53	13982-63-3	
Radium-228	EPA 904.0	**0.907 ± 0.432 (0.751)** **C:78% T:91%**	pCi/L	08/03/16 21:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-5 **Lab ID: 92304768003** Collected: 07/11/16 14:10 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.092 ± 0.419 (0.853)** **C:NA T:94%**	pCi/L	08/05/16 13:12	13982-63-3	
Radium-228	EPA 904.0	**0.568 ± 0.368 (0.690)** **C:78% T:85%**	pCi/L	08/03/16 21:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: LEACHATE-1 **Lab ID: 92304768004** Collected: 07/11/16 14:15 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.087 ± 0.464 (0.962) C:NA T:84%**	pCi/L	08/05/16 12:57	13982-63-3	
Radium-228	EPA 904.0	**0.151 ± 0.440 (0.958) C:78% T:68%**	pCi/L	08/03/16 21:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: MW-3 **Lab ID: 92304768005** Collected: 07/11/16 15:55 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.308 ± 0.620 (0.997)** **C:NA T:93%**	pCi/L	08/05/16 12:30	13982-63-3	
Radium-228	EPA 904.0	**0.801 ± 0.385 (0.658)** **C:82% T:85%**	pCi/L	08/03/16 21:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: AMBIENT BLANK **Lab ID: 92304768006** Collected: 07/11/16 14:30 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.240 ± 0.465 (0.989) C:NA T:97%**	pCi/L	08/05/16 13:09	13982-63-3	
Radium-228	EPA 904.0	**0.187 ± 0.290 (0.613) C:82% T:89%**	pCi/L	08/03/16 21:15	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Sample: EQ BLANK **Lab ID: 92304768007** Collected: 07/11/16 16:00 Received: 07/12/16 12:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.483 ± 0.502 (0.748)** **C:NA T:95%**	pCi/L	08/05/16 13:26	13982-63-3	
Radium-228	EPA 904.0	**0.448 ± 0.355 (0.694)** **C:79% T:85%**	pCi/L	08/03/16 21:15	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 227869 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 1116150 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.117 ± 0.537 (0.991) C:NA T:99%	pCi/L	08/05/16 12:46	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

QC Batch: 227841 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92304768001, 92304768002, 92304768003, 92304768004, 92304768005, 92304768006, 92304768007

METHOD BLANK: 1116108 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.614 ± 0.404 (0.763) C:85% T:72%	pCi/L	08/03/16 21:15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92304768001	**MW-7**	EPA 300.0	321171		
92304768002	**MW-6**	EPA 300.0	321171		
92304768003	**MW-5**	EPA 300.0	321171		
92304768004	**LEACHATE-1**	EPA 300.0	321171		
92304768005	**MW-3**	EPA 300.0	321171		
92304768006	**AMBIENT BLANK**	EPA 300.0	321171		
92304768007	**EQ BLANK**	EPA 300.0	321171		
92304768001	**MW-7**	EPA 3010A	321105	EPA 6010	321279
92304768002	**MW-6**	EPA 3010A	321105	EPA 6010	321279
92304768003	**MW-5**	EPA 3010A	321105	EPA 6010	321279
92304768004	**LEACHATE-1**	EPA 3010A	321105	EPA 6010	321279
92304768005	**MW-3**	EPA 3010A	321105	EPA 6010	321279
92304768006	**AMBIENT BLANK**	EPA 3010A	321105	EPA 6010	321279
92304768007	**EQ BLANK**	EPA 3010A	321105	EPA 6010	321279
92304768001	**MW-7**	EPA 3020	425502	EPA 6020B	425786
92304768002	**MW-6**	EPA 3020	425502	EPA 6020B	425786
92304768003	**MW-5**	EPA 3020	425502	EPA 6020B	425786
92304768004	**LEACHATE-1**	EPA 3020	425502	EPA 6020B	425786
92304768005	**MW-3**	EPA 3020	425502	EPA 6020B	425786
92304768006	**AMBIENT BLANK**	EPA 3020	425502	EPA 6020B	425786
92304768007	**EQ BLANK**	EPA 3020	425502	EPA 6020B	425786
92304768001	**MW-7**	EPA 7470	321122	EPA 7470	321303
92304768002	**MW-6**	EPA 7470	321122	EPA 7470	321303
92304768003	**MW-5**	EPA 7470	321123	EPA 7470	321305
92304768004	**LEACHATE-1**	EPA 7470	321123	EPA 7470	321305
92304768005	**MW-3**	EPA 7470	321123	EPA 7470	321305
92304768006	**AMBIENT BLANK**	EPA 7470	321123	EPA 7470	321305
92304768007	**EQ BLANK**	EPA 7470	321123	EPA 7470	321305
92304768001	**MW-7**	EPA 8260	321048		
92304768002	**MW-6**	EPA 8260	321048		
92304768003	**MW-5**	EPA 8260	321048		
92304768004	**LEACHATE-1**	EPA 8260	321048		
92304768005	**MW-3**	EPA 8260	321048		
92304768006	**AMBIENT BLANK**	EPA 8260	321048		
92304768007	**EQ BLANK**	EPA 8260	321048		
92304768008	**TRIP BLANK**	EPA 8260	321048		
92304768001	**MW-7**	EPA 903.1	227869		
92304768002	**MW-6**	EPA 903.1	227869		
92304768003	**MW-5**	EPA 903.1	227869		
92304768004	**LEACHATE-1**	EPA 903.1	227869		
92304768005	**MW-3**	EPA 903.1	227869		
92304768006	**AMBIENT BLANK**	EPA 903.1	227869		
92304768007	**EQ BLANK**	EPA 903.1	227869		
92304768001	**MW-7**	EPA 904.0	227841		
92304768002	**MW-6**	EPA 904.0	227841		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH - BRICKHAVEN
Pace Project No.: 92304768

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92304768003	**MW-5**	EPA 904.0	227841		
92304768004	**LEACHATE-1**	EPA 904.0	227841		
92304768005	**MW-3**	EPA 904.0	227841		
92304768006	**AMBIENT BLANK**	EPA 904.0	227841		
92304768007	**EQ BLANK**	EPA 904.0	227841		
92304768001	**MW-7**	SM 2540C	321217		
92304768002	**MW-6**	SM 2540C	321217		
92304768003	**MW-5**	SM 2540C	321217		
92304768004	**LEACHATE-1**	SM 2540C	321217		
92304768005	**MW-3**	SM 2540C	321217		
92304768006	**AMBIENT BLANK**	SM 2540C	321217		
92304768007	**EQ BLANK**	SM 2540C	321217		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised:April 25, 2016 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.19**	Issuing Authority: Pace Huntersville Quality Office

Page 2 of 2 for Internal Use ONLY

Sample Condition Upon Receipt

Client Name: Chenah

Project #:

WO# : 92304768

92304768

Courier: ☐ Commercial ☐ Fed Ex ☑ Pace ☐ UPS ☐ USPS ☐ Other:____ ☐ Client

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: 7/12

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other:____

Thermometer: T1505 **Type of Ice:** ☐ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 4.1 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNC3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	☐ Yes	☐ No	☑ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	12.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	13.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):____				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: JY **Date:** 7/13/16

Project Manager SRF Review: JY **Date:** 7/13/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995525

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Charah - Brickhaven	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #: 7672-1

REGULATORY AGENCY

- ☐ NPDES
- ☑ GROUND WATER
- ☐ DRINKING WATER
- ☐ UST
- ☐ RCRA
- ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	RAD	8260	Metals	Fluoride	Chloride/Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92304768
1	MW-7					07/11/16	0955		11										3	3	2	1	1	1		001
2	MW-6					07/11/16	1240		11										3	3	2	1	1	1		002
3	MW-5					07/11/16	1410		11										3	3	2	1	1	1		003
4	Leachate-1					07/11/16	1415		11										3	3	2	1	1	1		004
5	MW-3					07/11/16	1555		11										3	3	2	1	1	1		005
6																										
7																										
8																										
9	Ambient Blank		G			07/11/16	1430		11										3	3	2	1	1	1		006
10	EQ Blank		G			07/11/16	1600		11										3	3	2	1	1	1		007
11	Trip Blank		G			07/11/16	0800		2											2						008
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	07/11/16		Dmouel/Pace HVL	7/12	1045	41	4	U	4

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 07/11/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 08, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on July 13, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

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CERTIFICATIONS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92304962001	**SW-2**	Water	07/12/16 09:30	07/13/16 08:12
92304962002	**SW-1**	Water	07/12/16 10:30	07/13/16 08:12
92304962003	**BG-1**	Water	07/12/16 11:15	07/13/16 08:12
92304962004	**MW-8**	Water	07/12/16 13:00	07/13/16 08:12
92304962005	**MW-1**	Water	07/12/16 14:50	07/13/16 08:12
92304962006	**MW-1-FD**	Water	07/12/16 15:15	07/13/16 08:12
92304962007	**MW-2**	Water	07/12/16 17:40	07/13/16 08:12
92304962008	**AMB BLANK**	Water	07/12/16 15:30	07/13/16 08:12
92304962009	**EQ BLANK**	Water	07/12/16 19:00	07/13/16 08:12
92304962010	**TRIP BLANK**	Water	07/12/16 08:00	07/13/16 08:12

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SAMPLE ANALYTE COUNT

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92304962001	**SW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962002	**SW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962003	**BG-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962004	**MW-8**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962005	**MW-1**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	JMW	1	PASI-A
		EPA 8260	GAW	48	PASI-C

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SAMPLE ANALYTE COUNT

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962006	**MW-1-FD**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	JMW	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962007	**MW-2**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	JMW	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962008	**AMB BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	JMW	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962009	**EQ BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	JMW	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92304962010	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304962001	**SW-2**					
EPA 300.0	Chloride	7.0	mg/L	1.0	07/16/16 03:30	
EPA 300.0	Sulfate	8.8	mg/L	1.0	07/16/16 03:30	
EPA 6010	Barium	170	ug/L	5.0	07/18/16 22:32	
EPA 6010	Calcium	16800	ug/L	100	07/18/16 22:32	
EPA 6010	Cobalt	19.1	ug/L	5.0	07/18/16 22:32	
EPA 6020B	Boron	36.2	ug/L	5.0	07/19/16 20:26	
EPA 903.1	Radium-226	0.000 ± 0.411 (0.663) C:NA T:86%	pCi/L		08/05/16 12:11	
EPA 904.0	Radium-228	0.674 ± 0.350 (0.613) C:78% T:88%	pCi/L		08/04/16 01:31	
SM 2540C	Total Dissolved Solids	167	mg/L	25.0	07/19/16 15:59	
92304962002	**SW-1**					
EPA 300.0	Chloride	16.1	mg/L	1.0	07/16/16 03:52	
EPA 300.0	Sulfate	12.2	mg/L	1.0	07/16/16 03:52	
EPA 6010	Barium	72.9	ug/L	5.0	07/18/16 22:41	
EPA 6010	Calcium	2760	ug/L	100	07/18/16 22:41	
EPA 6010	Vanadium	5.6	ug/L	5.0	07/18/16 22:41	
EPA 6010	Zinc	10.6	ug/L	10.0	07/18/16 22:41	
EPA 6020B	Boron	17.4	ug/L	5.0	07/19/16 19:36	
EPA 6020B	Lithium	1.4	ug/L	0.50	07/19/16 19:36	
EPA 903.1	Radium-226	-0.039 ± 0.506 (0.990) C:NA T:66%	pCi/L		08/05/16 12:19	
EPA 904.0	Radium-228	0.0698 ± 0.353 (0.769) C:80% T:76%	pCi/L		08/04/16 01:31	
SM 2540C	Total Dissolved Solids	81.0	mg/L	25.0	07/19/16 16:00	
92304962003	**BG-1**					
EPA 300.0	Chloride	292	mg/L	6.0	07/16/16 13:11	
EPA 300.0	Fluoride	0.11	mg/L	0.10	07/16/16 04:14	
EPA 300.0	Sulfate	18.2	mg/L	1.0	07/16/16 04:14	
EPA 6010	Barium	363	ug/L	5.0	07/18/16 22:45	
EPA 6010	Calcium	31600	ug/L	100	07/18/16 22:45	
EPA 6010	Vanadium	5.1	ug/L	5.0	07/18/16 22:45	
EPA 6020B	Boron	7.0	ug/L	5.0	07/19/16 19:41	
EPA 6020B	Lithium	23.8	ug/L	0.50	07/19/16 19:41	
EPA 903.1	Radium-226	0.777 ± 0.617 (0.801) C:NA T:92%	pCi/L		08/05/16 12:27	

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SUMMARY OF DETECTION

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304962003	**BG-1**					
EPA 904.0	Radium-228	0.163 ± 0.293 (0.618) C:79% T:87%	pCi/L		08/04/16 01:31	
SM 2540C	Total Dissolved Solids	668	mg/L	25.0	07/19/16 16:00	
92304962004	**MW-8**					
EPA 300.0	Chloride	504	mg/L	10.0	07/16/16 13:39	
EPA 300.0	Sulfate	5.9	mg/L	1.0	07/16/16 04:36	
EPA 6010	Antimony	7.2	ug/L	5.0	07/18/16 22:48	
EPA 6010	Barium	1200	ug/L	5.0	07/18/16 22:48	
EPA 6010	Calcium	125000	ug/L	1000	07/19/16 12:20	
EPA 6010	Zinc	17.8	ug/L	10.0	07/18/16 22:48	
EPA 6020B	Boron	9.6	ug/L	5.0	07/19/16 19:45	
EPA 6020B	Lithium	31.2	ug/L	0.50	07/19/16 19:45	
EPA 903.1	Radium-226	0.616 ± 0.570 (0.829) C:NA T:100%	pCi/L		08/06/16 11:45	
EPA 904.0	Radium-228	0.548 ± 0.346 (0.640) C:80% T:81%	pCi/L		08/04/16 01:31	
SM 2540C	Total Dissolved Solids	1340	mg/L	125	07/19/16 16:04	
92304962005	**MW-1**					
EPA 300.0	Chloride	547	mg/L	11.0	07/16/16 14:07	
EPA 300.0	Fluoride	0.12	mg/L	0.10	07/16/16 04:58	
EPA 300.0	Sulfate	9.4	mg/L	1.0	07/16/16 04:58	
EPA 6010	Antimony	6.1	ug/L	5.0	07/18/16 22:51	
EPA 6010	Barium	225	ug/L	5.0	07/18/16 22:51	
EPA 6010	Calcium	127000	ug/L	1000	07/19/16 12:23	
EPA 6010	Zinc	13.2	ug/L	10.0	07/18/16 22:51	
EPA 6020B	Boron	7.9	ug/L	5.0	07/19/16 19:50	
EPA 6020B	Lithium	32.8	ug/L	0.50	07/19/16 19:50	
EPA 903.1	Radium-226	0.448 ± 0.362 (0.202) C:NA T:102%	pCi/L		08/06/16 11:59	
EPA 904.0	Radium-228	0.833 ± 0.382 (0.642) C:77% T:87%	pCi/L		08/04/16 01:32	
SM 2540C	Total Dissolved Solids	1410	mg/L	125	07/19/16 16:05	
92304962006	**MW-1-FD**					
EPA 300.0	Chloride	573	mg/L	11.0	07/16/16 14:35	

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SUMMARY OF DETECTION

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304962006	**MW-1-FD**					
EPA 300.0	Fluoride	0.12	mg/L	0.10	07/16/16 05:20	
EPA 300.0	Sulfate	9.6	mg/L	1.0	07/16/16 05:20	
EPA 6010	Antimony	7.3	ug/L	5.0	07/18/16 22:54	
EPA 6010	Barium	229	ug/L	5.0	07/18/16 22:54	
EPA 6010	Calcium	122000	ug/L	1000	07/19/16 12:27	
EPA 6010	Zinc	12.0	ug/L	10.0	07/18/16 22:54	
EPA 6020B	Boron	7.5	ug/L	5.0	07/19/16 19:54	
EPA 6020B	Lithium	32.9	ug/L	0.50	07/19/16 19:54	
EPA 903.1	Radium-226	0.000 ± 0.427 (0.926) C:NA T:97%	pCi/L		08/06/16 12:21	
EPA 904.0	Radium-228	0.194 ± 0.271 (0.563) C:82% T:90%	pCi/L		08/04/16 01:32	
SM 2540C	Total Dissolved Solids	1590	mg/L	125	07/19/16 16:06	
92304962007	**MW-2**					
EPA 300.0	Chloride	1160	mg/L	16.0	07/16/16 15:03	M6
EPA 300.0	Fluoride	0.14	mg/L	0.10	07/16/16 06:26	
EPA 300.0	Sulfate	205	mg/L	16.0	07/16/16 15:03	M6
EPA 6010	Antimony	12.3	ug/L	5.0	07/18/16 22:57	
EPA 6010	Barium	220	ug/L	5.0	07/18/16 22:57	
EPA 6010	Calcium	159000	ug/L	1000	07/20/16 01:04	
EPA 6010	Chromium	5.2	ug/L	5.0	07/18/16 22:57	
EPA 6010	Molybdenum	10.8	ug/L	5.0	07/18/16 22:57	
EPA 6010	Zinc	37.9	ug/L	10.0	07/18/16 22:57	
EPA 6020B	Boron	39.4	ug/L	5.0	07/19/16 19:58	
EPA 6020B	Lithium	356	ug/L	0.50	07/19/16 19:58	
EPA 903.1	Radium-226	0.580 ± 0.542 (0.769) C:NA T:94%	pCi/L		08/06/16 12:21	
EPA 904.0	Radium-228	0.980 ± 0.406 (0.651) C:78% T:85%	pCi/L		08/04/16 01:32	
SM 2540C	Total Dissolved Solids	3290	mg/L	250	07/19/16 16:06	
92304962008	**AMB BLANK**					
EPA 8260	2-Butanone (MEK)	5.7	ug/L	5.0	07/15/16 14:47	
EPA 903.1	Radium-226	0.473 ± 0.382 (0.214) C:NA T:94%	pCi/L		08/06/16 11:56	

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SUMMARY OF DETECTION

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92304962008	**AMB BLANK**					
EPA 904.0	Radium-228	0.534 ± 0.321 (0.580) C:74% T:85%	pCi/L		08/05/16 01:08	
92304962009	**EQ BLANK**					
EPA 8260	Acetone	25.1	ug/L	25.0	07/15/16 15:03	
EPA 8260	2-Butanone (MEK)	6.0	ug/L	5.0	07/15/16 15:03	
EPA 903.1	Radium-226	0.180 ± 0.530 (0.981) C:NA T:97%	pCi/L		08/06/16 12:20	
EPA 904.0	Radium-228	0.516 ± 0.305 (0.547) C:76% T:89%	pCi/L		08/05/16 01:08	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: SW-2 **Lab ID: 92304962001** Collected: 07/12/16 09:30 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**7.0**	mg/L	1.0	1		07/16/16 03:30	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/16/16 03:30	16984-48-8	
Sulfate	**8.8**	mg/L	1.0	1		07/16/16 03:30	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:32	7440-38-2	
Barium	**170**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:32	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:32	7440-43-9	
Calcium	**16800**	ug/L	100	1	07/15/16 22:30	07/18/16 22:32	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-47-3	
Cobalt	**19.1**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:32	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:32	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:32	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:32	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**36.2**	ug/L	5.0	1	07/18/16 09:36	07/19/16 20:26	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/18/16 09:36	07/19/16 20:26	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 02:43	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 02:46	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 02:46	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 02:46	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 02:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 02:46	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 02:46	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 02:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 02:46	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 02:46	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 02:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 02:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 02:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 02:46	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 02:46	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 02:46	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: SW-2 **Lab ID: 92304962001** Collected: 07/12/16 09:30 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 02:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 02:46	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 02:46	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 02:46	110-57-6	L3
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 02:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 02:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 02:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 02:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 02:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 02:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 02:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 02:46	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 02:46	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 02:46	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 02:46	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 02:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 02:46	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 02:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 02:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 02:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 02:46	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 02:46	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 02:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 02:46	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 02:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 02:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 02:46	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 02:46	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 02:46	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 02:46	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		07/15/16 02:46	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	70-130	1		07/15/16 02:46	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/15/16 02:46	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**167**	mg/L	25.0	1		07/19/16 15:59		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: SW-1 **Lab ID: 92304962002** Collected: 07/12/16 10:30 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**16.1**	mg/L	1.0	1		07/16/16 03:52	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/16/16 03:52	16984-48-8	
Sulfate	**12.2**	mg/L	1.0	1		07/16/16 03:52	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:41	7440-38-2	
Barium	**72.9**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:41	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:41	7440-43-9	
Calcium	**2760**	ug/L	100	1	07/15/16 22:30	07/18/16 22:41	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:41	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:41	7440-28-0	
Vanadium	**5.6**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:41	7440-62-2	
Zinc	**10.6**	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:41	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**17.4**	ug/L	5.0	1	07/18/16 09:36	07/19/16 19:36	7440-42-8	
Lithium	**1.4**	ug/L	0.50	1	07/18/16 09:36	07/19/16 19:36	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 02:45	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 03:03	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 03:03	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 03:03	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 03:03	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 03:03	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 03:03	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 03:03	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 03:03	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 03:03	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 03:03	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 03:03	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 03:03	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 03:03	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 03:03	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 03:03	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: SW-1 **Lab ID: 92304962002** Collected: 07/12/16 10:30 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 03:03	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 03:03	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 03:03	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 03:03	110-57-6	L3
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 03:03	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 03:03	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 03:03	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 03:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 03:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 03:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 03:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 03:03	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 03:03	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 03:03	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 03:03	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 03:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 03:03	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 03:03	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 03:03	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 03:03	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 03:03	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 03:03	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 03:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 03:03	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 03:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 03:03	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 03:03	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 03:03	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 03:03	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 03:03	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	106	%	70-130	1		07/15/16 03:03	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	70-130	1		07/15/16 03:03	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/15/16 03:03	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**81.0**	mg/L	25.0	1		07/19/16 16:00		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: BG-1 **Lab ID: 92304962003** Collected: 07/12/16 11:15 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**292**	mg/L	6.0	6		07/16/16 13:11	16887-00-6	
Fluoride	**0.11**	mg/L	0.10	1		07/16/16 04:14	16984-48-8	
Sulfate	**18.2**	mg/L	1.0	1		07/16/16 04:14	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:45	7440-38-2	
Barium	**363**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:45	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:45	7440-43-9	
Calcium	**31600**	ug/L	100	1	07/15/16 22:30	07/18/16 22:45	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:45	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:45	7440-28-0	
Vanadium	**5.1**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:45	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:45	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**7.0**	ug/L	5.0	1	07/18/16 09:36	07/19/16 19:41	7440-42-8	
Lithium	**23.8**	ug/L	0.50	1	07/18/16 09:36	07/19/16 19:41	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 02:47	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 16:11	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 16:11	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 16:11	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 16:11	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 16:11	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 16:11	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 16:11	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 16:11	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 16:11	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 16:11	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 16:11	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 16:11	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 16:11	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 16:11	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 16:11	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: BG-1 **Lab ID: 92304962003** Collected: 07/12/16 11:15 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 16:11	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 16:11	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 16:11	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 16:11	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 16:11	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 16:11	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:11	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:11	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 16:11	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 16:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 16:11	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 16:11	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 16:11	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 16:11	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 16:11	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 16:11	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 16:11	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 16:11	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 16:11	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 16:11	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 16:11	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 16:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 16:11	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 16:11	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 16:11	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 16:11	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 16:11	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 16:11	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 16:11	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		07/15/16 16:11	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	70-130	1		07/15/16 16:11	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		07/15/16 16:11	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**668**	mg/L	25.0	1		07/19/16 16:00		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-8 **Lab ID: 92304962004** Collected: 07/12/16 13:00 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**504**	mg/L	10.0	10		07/16/16 13:39	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/16/16 04:36	16984-48-8	
Sulfate	**5.9**	mg/L	1.0	1		07/16/16 04:36	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**7.2**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:48	7440-38-2	
Barium	**1200**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:48	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:48	7440-43-9	
Calcium	**125000**	ug/L	1000	10	07/15/16 22:30	07/19/16 12:20	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:48	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:48	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:48	7440-62-2	
Zinc	**17.8**	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:48	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**9.6**	ug/L	5.0	1	07/18/16 09:36	07/19/16 19:45	7440-42-8	
Lithium	**31.2**	ug/L	0.50	1	07/18/16 09:36	07/19/16 19:45	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 02:50	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 16:29	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 16:29	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 16:29	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 16:29	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 16:29	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 16:29	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 16:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 16:29	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 16:29	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 16:29	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 16:29	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 16:29	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 16:29	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 16:29	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 16:29	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-8 **Lab ID: 92304962004** Collected: 07/12/16 13:00 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 16:29	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 16:29	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 16:29	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 16:29	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 16:29	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 16:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 16:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 16:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 16:29	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 16:29	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 16:29	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 16:29	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 16:29	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 16:29	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 16:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 16:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 16:29	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 16:29	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 16:29	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 16:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 16:29	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 16:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 16:29	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 16:29	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 16:29	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 16:29	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 16:29	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		07/15/16 16:29	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	70-130	1		07/15/16 16:29	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		07/15/16 16:29	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1340**	mg/L	125	1		07/19/16 16:04		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-1 **Lab ID: 92304962005** Collected: 07/12/16 14:50 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**547**	mg/L	11.0	11		07/16/16 14:07	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		07/16/16 04:58	16984-48-8	
Sulfate	**9.4**	mg/L	1.0	1		07/16/16 04:58	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**6.1**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:51	7440-38-2	
Barium	**225**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:51	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:51	7440-43-9	
Calcium	**127000**	ug/L	1000	10	07/15/16 22:30	07/19/16 12:23	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:51	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:51	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:51	7440-62-2	
Zinc	**13.2**	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:51	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**7.9**	ug/L	5.0	1	07/18/16 09:36	07/19/16 19:50	7440-42-8	
Lithium	**32.8**	ug/L	0.50	1	07/18/16 09:36	07/19/16 19:50	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 06:23	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 16:46	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 16:46	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 16:46	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 16:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 16:46	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 16:46	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 16:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 16:46	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 16:46	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 16:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 16:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 16:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 16:46	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 16:46	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 16:46	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-1 **Lab ID: 92304962005** Collected: 07/12/16 14:50 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 16:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 16:46	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 16:46	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 16:46	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 16:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 16:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 16:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 16:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 16:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 16:46	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 16:46	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 16:46	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 16:46	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 16:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 16:46	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 16:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 16:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 16:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 16:46	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 16:46	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 16:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 16:46	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 16:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 16:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 16:46	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 16:46	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 16:46	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 16:46	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		07/15/16 16:46	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	70-130	1		07/15/16 16:46	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/15/16 16:46	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1410**	mg/L	125	1		07/19/16 16:05		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-1-FD **Lab ID: 92304962006** Collected: 07/12/16 15:15 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**573**	mg/L	11.0	11		07/16/16 14:35	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		07/16/16 05:20	16984-48-8	
Sulfate	**9.6**	mg/L	1.0	1		07/16/16 05:20	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**7.3**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:54	7440-38-2	
Barium	**229**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:54	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:54	7440-43-9	
Calcium	**122000**	ug/L	1000	10	07/15/16 22:30	07/19/16 12:27	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:54	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:54	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:54	7440-62-2	
Zinc	**12.0**	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:54	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**7.5**	ug/L	5.0	1	07/18/16 09:36	07/19/16 19:54	7440-42-8	
Lithium	**32.9**	ug/L	0.50	1	07/18/16 09:36	07/19/16 19:54	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 06:30	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 17:02	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 17:02	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 17:02	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 17:02	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 17:02	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 17:02	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 17:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 17:02	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 17:02	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 17:02	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 17:02	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 17:02	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 17:02	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 17:02	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 17:02	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-1-FD **Lab ID: 92304962006** Collected: 07/12/16 15:15 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 17:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 17:02	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 17:02	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 17:02	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 17:02	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 17:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 17:02	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 17:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 17:02	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 17:02	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 17:02	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 17:02	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 17:02	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 17:02	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 17:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 17:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 17:02	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 17:02	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 17:02	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 17:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 17:02	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 17:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 17:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 17:02	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 17:02	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 17:02	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 17:02	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	103	%	70-130	1		07/15/16 17:02	460-00-4	
1,2-Dichloroethane-d4 (S)	85	%	70-130	1		07/15/16 17:02	17060-07-0	
Toluene-d8 (S)	99	%	70-130	1		07/15/16 17:02	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1590**	mg/L	125	1		07/19/16 16:06		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-2 **Lab ID: 92304962007** Collected: 07/12/16 17:40 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**1160**	mg/L	16.0	16		07/16/16 15:03	16887-00-6	M6
Fluoride	**0.14**	mg/L	0.10	1		07/16/16 06:26	16984-48-8	
Sulfate	**205**	mg/L	16.0	16		07/16/16 15:03	14808-79-8	M6
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**12.3**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:57	7440-38-2	
Barium	**220**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:57	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 22:57	7440-43-9	
Calcium	**159000**	ug/L	1000	10	07/15/16 22:30	07/20/16 01:04	7440-70-2	
Chromium	**5.2**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7439-92-1	
Molybdenum	**10.8**	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:57	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 22:57	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 22:57	7440-62-2	
Zinc	**37.9**	ug/L	10.0	1	07/15/16 22:30	07/18/16 22:57	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**39.4**	ug/L	5.0	1	07/18/16 09:36	07/19/16 19:58	7440-42-8	
Lithium	**356**	ug/L	0.50	1	07/18/16 09:36	07/19/16 19:58	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 06:32	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 17:19	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 17:19	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 17:19	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 17:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 17:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 17:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 17:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 17:19	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 17:19	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 17:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 17:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 17:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 17:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 17:19	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 17:19	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-2 **Lab ID: 92304962007** Collected: 07/12/16 17:40 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 17:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 17:19	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 17:19	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 17:19	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 17:19	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 17:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 17:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 17:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 17:19	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 17:19	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 17:19	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 17:19	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 17:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 17:19	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 17:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 17:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 17:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 17:19	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 17:19	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 17:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 17:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 17:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 17:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 17:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 17:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 17:19	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 17:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		07/15/16 17:19	460-00-4	
1,2-Dichloroethane-d4 (S)	84	%	70-130	1		07/15/16 17:19	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/15/16 17:19	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**3290**	mg/L	250	1		07/19/16 16:06		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: AMB BLANK **Lab ID: 92304962008** Collected: 07/12/16 15:30 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		07/16/16 07:33	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/16/16 07:33	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/16/16 07:33	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 23:00	7440-38-2	
Barium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 23:00	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 23:00	7440-43-9	
Calcium	ND	ug/L	100	1	07/15/16 22:30	07/18/16 23:00	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 23:00	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 23:00	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:00	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 23:00	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	07/18/16 09:36	07/19/16 20:03	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/18/16 09:36	07/19/16 20:03	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 06:34	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 14:47	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 14:47	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 14:47	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 14:47	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 14:47	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 14:47	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 14:47	74-83-9	
2-Butanone (MEK)	**5.7**	ug/L	5.0	1		07/15/16 14:47	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 14:47	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 14:47	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 14:47	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 14:47	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 14:47	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 14:47	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 14:47	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: AMB BLANK **Lab ID: 92304962008** Collected: 07/12/16 15:30 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 14:47	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 14:47	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 14:47	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 14:47	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 14:47	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 14:47	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 14:47	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 14:47	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 14:47	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 14:47	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 14:47	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 14:47	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 14:47	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 14:47	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 14:47	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 14:47	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 14:47	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 14:47	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 14:47	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 14:47	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 14:47	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 14:47	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 14:47	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 14:47	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 14:47	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 14:47	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 14:47	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 14:47	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 14:47	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 14:47	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		07/15/16 14:47	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	70-130	1		07/15/16 14:47	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/15/16 14:47	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		07/19/16 16:07		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: EQ BLANK **Lab ID: 92304962009** Collected: 07/12/16 19:00 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		07/16/16 07:55	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/16/16 07:55	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/16/16 07:55	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 23:13	7440-38-2	
Barium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 23:13	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/15/16 22:30	07/18/16 23:13	7440-43-9	
Calcium	ND	ug/L	100	1	07/15/16 22:30	07/18/16 23:13	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-48-4	
Copper	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-50-8	
Lead	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 23:13	7782-49-2	
Silver	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/15/16 22:30	07/18/16 23:13	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/15/16 22:30	07/18/16 23:13	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/15/16 22:30	07/18/16 23:13	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	07/18/16 09:36	07/19/16 20:07	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/18/16 09:36	07/19/16 20:07	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/19/16 06:37	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	**25.1**	ug/L	25.0	1		07/15/16 15:03	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 15:03	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 15:03	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 15:03	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 15:03	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 15:03	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 15:03	74-83-9	
2-Butanone (MEK)	**6.0**	ug/L	5.0	1		07/15/16 15:03	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 15:03	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 15:03	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 15:03	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 15:03	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 15:03	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 15:03	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 15:03	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: EQ BLANK **Lab ID: 92304962009** Collected: 07/12/16 19:00 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 15:03	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:03	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:03	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 15:03	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:03	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:03	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:03	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 15:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:03	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 15:03	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 15:03	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 15:03	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 15:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 15:03	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 15:03	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:03	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:03	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 15:03	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 15:03	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:03	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 15:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 15:03	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 15:03	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 15:03	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 15:03	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 15:03	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	102	%	70-130	1		07/15/16 15:03	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	70-130	1		07/15/16 15:03	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/15/16 15:03	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		07/19/16 16:07		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: TRIP BLANK **Lab ID: 92304962010** Collected: 07/12/16 08:00 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 14:30	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 14:30	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 14:30	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 14:30	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 14:30	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 14:30	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 14:30	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 14:30	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 14:30	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 14:30	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 14:30	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 14:30	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 14:30	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 14:30	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 14:30	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/15/16 14:30	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 14:30	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 14:30	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 14:30	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 14:30	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 14:30	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 14:30	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 14:30	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 14:30	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 14:30	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 14:30	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 14:30	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 14:30	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 14:30	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 14:30	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 14:30	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 14:30	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 14:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 14:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 14:30	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 14:30	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 14:30	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 14:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 14:30	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 14:30	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 14:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 14:30	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 14:30	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 14:30	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 14:30	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		07/15/16 14:30	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: TRIP BLANK **Lab ID: 92304962010** Collected: 07/12/16 08:00 Received: 07/13/16 08:12 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	86	%	70-130	1		07/15/16 14:30	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/15/16 14:30	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321322 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

METHOD BLANK: 1780730 | Matrix: Water
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/16/16 00:12	
Fluoride	mg/L	ND	0.10	07/16/16 00:12	
Sulfate	mg/L	ND	1.0	07/16/16 00:12	

LABORATORY CONTROL SAMPLE: 1780731

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.2	100	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	50	48.5	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780732 1780733

Parameter	Units	92304868003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.5	50	50	54.6	55.0	102	103	90-110	1	20	
Fluoride	mg/L	0.026J	2.5	2.5	2.4	2.4	96	97	90-110	1	20	
Sulfate	mg/L	0.62J	50	50	49.9	50.4	99	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780734 1780735

Parameter	Units	92304962007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1160	50	50	1270	1110	227	-97	90-110	14	20	M6
Fluoride	mg/L	0.14	2.5	2.5	2.6	2.6	98	98	90-110	1	20	
Sulfate	mg/L	205	50	50	271	247	132	83	90-110	9	20	M6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321286 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004

METHOD BLANK: 1780620 | Matrix: Water
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/19/16 01:46	

LABORATORY CONTROL SAMPLE: 1780621

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780622 1780623

Parameter	Units	92304886001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	91	90	75-125	1	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321287 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

METHOD BLANK: 1780624 | Matrix: Water
Associated Lab Samples: 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/19/16 06:18	

LABORATORY CONTROL SAMPLE: 1780625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780626 1780627

Parameter	Units	92304962005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.6	2.6	101	101	75-125	0	25	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321270 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

METHOD BLANK: 1780608 | Matrix: Water
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/18/16 22:17	
Arsenic	ug/L	ND	10.0	07/18/16 22:17	
Barium	ug/L	ND	5.0	07/18/16 22:17	
Beryllium	ug/L	ND	1.0	07/18/16 22:17	
Cadmium	ug/L	ND	1.0	07/18/16 22:17	
Calcium	ug/L	ND	100	07/18/16 22:17	
Chromium	ug/L	ND	5.0	07/18/16 22:17	
Cobalt	ug/L	ND	5.0	07/18/16 22:17	
Copper	ug/L	ND	5.0	07/18/16 22:17	
Lead	ug/L	ND	5.0	07/18/16 22:17	
Molybdenum	ug/L	ND	5.0	07/18/16 22:17	
Nickel	ug/L	ND	5.0	07/18/16 22:17	
Selenium	ug/L	ND	10.0	07/18/16 22:17	
Silver	ug/L	ND	5.0	07/18/16 22:17	
Thallium	ug/L	ND	5.4	07/18/16 22:17	
Vanadium	ug/L	ND	5.0	07/18/16 22:17	
Zinc	ug/L	ND	10.0	07/18/16 22:17	

LABORATORY CONTROL SAMPLE: 1780609

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	522	104	80-120	
Arsenic	ug/L	500	494	99	80-120	
Barium	ug/L	500	509	102	80-120	
Beryllium	ug/L	500	502	100	80-120	
Cadmium	ug/L	500	517	103	80-120	
Calcium	ug/L	5000	5120	102	80-120	
Chromium	ug/L	500	507	101	80-120	
Cobalt	ug/L	500	509	102	80-120	
Copper	ug/L	500	511	102	80-120	
Lead	ug/L	500	508	102	80-120	
Molybdenum	ug/L	500	541	108	80-120	
Nickel	ug/L	500	514	103	80-120	
Selenium	ug/L	500	510	102	80-120	
Silver	ug/L	250	258	103	80-120	
Thallium	ug/L	500	483	97	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	504	101	80-120	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780610 1780611

Parameter	Units	92304962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	521	515	104	103	75-125	1	25	
Arsenic	ug/L	ND	500	500	498	493	100	99	75-125	1	25	
Barium	ug/L	170	500	500	676	673	101	101	75-125	0	25	
Beryllium	ug/L	ND	500	500	507	502	101	100	75-125	1	25	
Cadmium	ug/L	ND	500	500	511	509	102	102	75-125	0	25	
Calcium	ug/L	16800	5000	5000	22300	21900	109	102	75-125	2	25	
Chromium	ug/L	ND	500	500	503	504	100	100	75-125	0	25	
Cobalt	ug/L	19.1	500	500	521	516	100	99	75-125	1	25	
Copper	ug/L	ND	500	500	515	511	103	102	75-125	1	25	
Lead	ug/L	ND	500	500	497	496	99	99	75-125	0	25	
Molybdenum	ug/L	ND	500	500	538	537	108	107	75-125	0	25	
Nickel	ug/L	ND	500	500	504	501	100	100	75-125	1	25	
Selenium	ug/L	ND	500	500	503	498	101	100	75-125	1	25	
Silver	ug/L	ND	250	250	246	244	98	98	75-125	1	25	
Thallium	ug/L	ND	500	500	477	472	95	94	75-125	1	25	
Vanadium	ug/L	ND	500	500	495	490	99	98	75-125	1	25	
Zinc	ug/L	ND	500	500	506	495	100	98	75-125	2	25	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 425714 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 | Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

METHOD BLANK: 2318624 | Matrix: Water
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	07/19/16 19:32	
Lithium	ug/L	ND	0.50	07/19/16 19:32	

LABORATORY CONTROL SAMPLE: 2318625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	102	102	80-120	
Lithium	ug/L	100	106	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318626 2318627

Parameter	Units	92304962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	36.2	100	100	140	136	104	100	75-125	3	20	
Lithium	ug/L	ND	100	100	101	101	101	101	75-125	0	20	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321246
Analysis Method: EPA 8260
QC Batch Method: EPA 8260
Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92304962001, 92304962002

METHOD BLANK: 1780415
Matrix: Water
Associated Lab Samples: 92304962001, 92304962002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	07/14/16 17:23	
1,1,1-Trichloroethane	ug/L	ND	1.0	07/14/16 17:23	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	07/14/16 17:23	
1,1,2-Trichloroethane	ug/L	ND	1.0	07/14/16 17:23	
1,1-Dichloroethane	ug/L	ND	1.0	07/14/16 17:23	
1,1-Dichloroethene	ug/L	ND	1.0	07/14/16 17:23	
1,2,3-Trichloropropane	ug/L	ND	1.0	07/14/16 17:23	
1,2-Dichlorobenzene	ug/L	ND	1.0	07/14/16 17:23	
1,2-Dichloroethane	ug/L	ND	1.0	07/14/16 17:23	
1,2-Dichloropropane	ug/L	ND	1.0	07/14/16 17:23	
1,4-Dichlorobenzene	ug/L	ND	1.0	07/14/16 17:23	
2-Butanone (MEK)	ug/L	ND	5.0	07/14/16 17:23	
2-Hexanone	ug/L	ND	5.0	07/14/16 17:23	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	07/14/16 17:23	
Acetone	ug/L	ND	25.0	07/14/16 17:23	
Acrylonitrile	ug/L	ND	10.0	07/14/16 17:23	
Benzene	ug/L	ND	1.0	07/14/16 17:23	
Bromochloromethane	ug/L	ND	1.0	07/14/16 17:23	
Bromodichloromethane	ug/L	ND	1.0	07/14/16 17:23	
Bromoform	ug/L	ND	1.0	07/14/16 17:23	
Bromomethane	ug/L	ND	2.0	07/14/16 17:23	
Carbon disulfide	ug/L	ND	2.0	07/14/16 17:23	
Carbon tetrachloride	ug/L	ND	1.0	07/14/16 17:23	
Chlorobenzene	ug/L	ND	1.0	07/14/16 17:23	
Chloroethane	ug/L	ND	1.0	07/14/16 17:23	
Chloroform	ug/L	ND	1.0	07/14/16 17:23	
Chloromethane	ug/L	ND	1.0	07/14/16 17:23	
cis-1,2-Dichloroethene	ug/L	ND	1.0	07/14/16 17:23	
cis-1,3-Dichloropropene	ug/L	ND	1.0	07/14/16 17:23	
Dibromochloromethane	ug/L	ND	1.0	07/14/16 17:23	
Dibromomethane	ug/L	ND	1.0	07/14/16 17:23	
Ethylbenzene	ug/L	ND	1.0	07/14/16 17:23	
Iodomethane	ug/L	ND	5.0	07/14/16 17:23	
Methylene Chloride	ug/L	ND	1.0	07/14/16 17:23	
Styrene	ug/L	ND	1.0	07/14/16 17:23	
Tetrachloroethene	ug/L	ND	1.0	07/14/16 17:23	
Toluene	ug/L	ND	1.0	07/14/16 17:23	
trans-1,2-Dichloroethene	ug/L	ND	1.0	07/14/16 17:23	
trans-1,3-Dichloropropene	ug/L	ND	1.0	07/14/16 17:23	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	07/14/16 17:23	
Trichloroethene	ug/L	ND	1.0	07/14/16 17:23	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

METHOD BLANK: 1780415 Matrix: Water
Associated Lab Samples: 92304962001, 92304962002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	07/14/16 17:23	
Vinyl acetate	ug/L	ND	2.0	07/14/16 17:23	
Vinyl chloride	ug/L	ND	1.0	07/14/16 17:23	
Xylene (Total)	ug/L	ND	1.0	07/14/16 17:23	
1,2-Dichloroethane-d4 (S)	%	88	70-130	07/14/16 17:23	
4-Bromofluorobenzene (S)	%	101	70-130	07/14/16 17:23	
Toluene-d8 (S)	%	101	70-130	07/14/16 17:23	

LABORATORY CONTROL SAMPLE: 1780416

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	52.1	104	80-125	
1,1,1-Trichloroethane	ug/L	50	45.5	91	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	49.1	98	79-124	
1,1,2-Trichloroethane	ug/L	50	52.1	104	85-125	
1,1-Dichloroethane	ug/L	50	45.8	92	73-126	
1,1-Dichloroethene	ug/L	50	45.3	91	66-135	
1,2,3-Trichloropropane	ug/L	50	48.6	97	75-130	
1,2-Dichlorobenzene	ug/L	50	54.1	108	80-133	
1,2-Dichloroethane	ug/L	50	41.6	83	67-128	
1,2-Dichloropropane	ug/L	50	48.2	96	75-132	
1,4-Dichlorobenzene	ug/L	50	51.1	102	78-130	
2-Butanone (MEK)	ug/L	100	100	100	61-144	
2-Hexanone	ug/L	100	99.2	99	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	105	105	72-135	
Acetone	ug/L	100	86.7	87	48-146	
Acrylonitrile	ug/L	250	244	98	40-160	
Benzene	ug/L	50	50.0	100	80-125	
Bromochloromethane	ug/L	50	48.1	96	71-125	
Bromodichloromethane	ug/L	50	48.8	98	78-124	
Bromoform	ug/L	50	44.6	89	71-128	
Bromomethane	ug/L	50	36.0	72	40-160	
Carbon disulfide	ug/L	50	50.6	101	50-160	
Carbon tetrachloride	ug/L	50	46.6	93	69-131	
Chlorobenzene	ug/L	50	50.3	101	81-122	
Chloroethane	ug/L	50	45.2	90	39-148	
Chloroform	ug/L	50	46.2	92	73-127	
Chloromethane	ug/L	50	44.1	88	44-146	
cis-1,2-Dichloroethene	ug/L	50	46.4	93	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.5	101	72-132	
Dibromochloromethane	ug/L	50	50.5	101	78-125	
Dibromomethane	ug/L	50	52.8	106	82-120	
Ethylbenzene	ug/L	50	47.6	95	79-121	
Iodomethane	ug/L	100	96.1	96	39-154	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

LABORATORY CONTROL SAMPLE: 1780416

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	50.4	101	64-133	
Styrene	ug/L	50	52.8	106	84-126	
Tetrachloroethene	ug/L	50	48.7	97	78-122	
Toluene	ug/L	50	50.4	101	80-121	
trans-1,2-Dichloroethene	ug/L	50	44.2	88	71-127	
trans-1,3-Dichloropropene	ug/L	50	47.7	95	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	82.4	165	40-160	L0
Trichloroethene	ug/L	50	51.0	102	78-122	
Trichlorofluoromethane	ug/L	50	45.5	91	53-137	
Vinyl acetate	ug/L	100	91.4	91	40-160	
Vinyl chloride	ug/L	50	45.9	92	58-137	
Xylene (Total)	ug/L	150	140	93	81-126	
1,2-Dichloroethane-d4 (S)	%			81	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 1780418

Parameter	Units	92304792011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.0	105	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	20.7	103	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	19.9	100	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.8	109	70-130	
1,1-Dichloroethane	ug/L	ND	20	20.9	105	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.4	107	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.7	99	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	22.3	111	70-130	
1,2-Dichloroethane	ug/L	ND	20	18.4	92	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.2	106	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.6	108	70-130	
2-Butanone (MEK)	ug/L	ND	40	41.9	105	70-130	
2-Hexanone	ug/L	ND	40	38.8	97	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.6	99	70-130	
Acetone	ug/L	ND	40	38.2	91	70-130	
Acrylonitrile	ug/L	ND	100	100	100	70-130	
Benzene	ug/L	ND	20	22.3	111	70-148	
Bromochloromethane	ug/L	ND	20	22.6	113	70-130	
Bromodichloromethane	ug/L	ND	20	20.5	103	70-130	
Bromoform	ug/L	ND	20	18.9	94	70-130	
Bromomethane	ug/L	ND	20	15.9	79	70-130	
Carbon disulfide	ug/L	ND	20	22.9	115	70-130	
Carbon tetrachloride	ug/L	ND	20	21.0	105	70-130	
Chlorobenzene	ug/L	ND	20	22.3	111	70-146	
Chloroethane	ug/L	ND	20	22.3	112	70-130	
Chloroform	ug/L	ND	20	20.4	102	70-130	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

MATRIX SPIKE SAMPLE: 1780418

Parameter	Units	92304792011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	21.1	106	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.5	108	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.4	102	70-130	
Dibromochloromethane	ug/L	ND	20	20.3	102	70-130	
Dibromomethane	ug/L	ND	20	22.5	113	70-130	
Ethylbenzene	ug/L	ND	20	21.8	109	70-130	
Iodomethane	ug/L	ND	40	31.4	79	70-130	
Methylene Chloride	ug/L	ND	20	21.1	106	70-130	
Styrene	ug/L	ND	20	23.1	115	70-130	
Tetrachloroethene	ug/L	ND	20	21.2	106	70-130	
Toluene	ug/L	ND	20	22.2	111	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.1	106	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.5	93	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	15.2	76	70-130	
Trichloroethene	ug/L	ND	20	22.3	112	69-151	
Trichlorofluoromethane	ug/L	ND	20	21.9	110	70-130	
Vinyl acetate	ug/L	ND	40	33.2	83	70-130	
Vinyl chloride	ug/L	ND	20	21.5	107	70-130	
1,2-Dichloroethane-d4 (S)	%				86	70-130	
4-Bromofluorobenzene (S)	%				105	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 1780417

Parameter	Units	92304792010 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

SAMPLE DUPLICATE: 1780417

Parameter	Units	92304792010 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	85	86	2		
4-Bromofluorobenzene (S)	%	100	104	4		
Toluene-d8 (S)	%	102	101	1		

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321369 | Analysis Method: EPA 8260
QC Batch Method: EPA 8260 | Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009, 92304962010

METHOD BLANK: 1781001 | Matrix: Water
Associated Lab Samples: 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009, 92304962010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1,1-Trichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1,2-Trichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1-Dichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1-Dichloroethene	ug/L	ND	1.0	07/15/16 13:22	
1,2,3-Trichloropropane	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichlorobenzene	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichloropropane	ug/L	ND	1.0	07/15/16 13:22	
1,4-Dichlorobenzene	ug/L	ND	1.0	07/15/16 13:22	
2-Butanone (MEK)	ug/L	ND	5.0	07/15/16 13:22	
2-Hexanone	ug/L	ND	5.0	07/15/16 13:22	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	07/15/16 13:22	
Acetone	ug/L	ND	25.0	07/15/16 13:22	
Acrylonitrile	ug/L	ND	10.0	07/15/16 13:22	
Benzene	ug/L	ND	1.0	07/15/16 13:22	
Bromochloromethane	ug/L	ND	1.0	07/15/16 13:22	
Bromodichloromethane	ug/L	ND	1.0	07/15/16 13:22	
Bromoform	ug/L	ND	1.0	07/15/16 13:22	
Bromomethane	ug/L	ND	2.0	07/15/16 13:22	
Carbon disulfide	ug/L	ND	2.0	07/15/16 13:22	
Carbon tetrachloride	ug/L	ND	1.0	07/15/16 13:22	
Chlorobenzene	ug/L	ND	1.0	07/15/16 13:22	
Chloroethane	ug/L	ND	1.0	07/15/16 13:22	
Chloroform	ug/L	ND	1.0	07/15/16 13:22	
Chloromethane	ug/L	ND	1.0	07/15/16 13:22	
cis-1,2-Dichloroethene	ug/L	ND	1.0	07/15/16 13:22	
cis-1,3-Dichloropropene	ug/L	ND	1.0	07/15/16 13:22	
Dibromochloromethane	ug/L	ND	1.0	07/15/16 13:22	
Dibromomethane	ug/L	ND	1.0	07/15/16 13:22	
Ethylbenzene	ug/L	ND	1.0	07/15/16 13:22	
Iodomethane	ug/L	ND	5.0	07/15/16 13:22	
Methylene Chloride	ug/L	ND	1.0	07/15/16 13:22	
Styrene	ug/L	ND	1.0	07/15/16 13:22	
Tetrachloroethene	ug/L	ND	1.0	07/15/16 13:22	
Toluene	ug/L	ND	1.0	07/15/16 13:22	
trans-1,2-Dichloroethene	ug/L	ND	1.0	07/15/16 13:22	
trans-1,3-Dichloropropene	ug/L	ND	1.0	07/15/16 13:22	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	07/15/16 13:22	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

METHOD BLANK: 1781001 Matrix: Water

Associated Lab Samples: 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009, 92304962010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichloroethene	ug/L	ND	1.0	07/15/16 13:22	
Trichlorofluoromethane	ug/L	ND	1.0	07/15/16 13:22	
Vinyl acetate	ug/L	ND	2.0	07/15/16 13:22	
Vinyl chloride	ug/L	ND	1.0	07/15/16 13:22	
Xylene (Total)	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichloroethane-d4 (S)	%	84	70-130	07/15/16 13:22	
4-Bromofluorobenzene (S)	%	102	70-130	07/15/16 13:22	
Toluene-d8 (S)	%	100	70-130	07/15/16 13:22	

LABORATORY CONTROL SAMPLE: 1781002

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	53.0	106	80-125	
1,1,1-Trichloroethane	ug/L	50	46.4	93	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	48.0	96	79-124	
1,1,2-Trichloroethane	ug/L	50	51.4	103	85-125	
1,1-Dichloroethane	ug/L	50	47.7	95	73-126	
1,1-Dichloroethene	ug/L	50	47.4	95	66-135	
1,2,3-Trichloropropane	ug/L	50	47.2	94	75-130	
1,2-Dichlorobenzene	ug/L	50	52.6	105	80-133	
1,2-Dichloroethane	ug/L	50	41.9	84	67-128	
1,2-Dichloropropane	ug/L	50	48.3	97	75-132	
1,4-Dichlorobenzene	ug/L	50	50.3	101	78-130	
2-Butanone (MEK)	ug/L	100	86.9	87	61-144	
2-Hexanone	ug/L	100	84.5	84	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	91.4	91	72-135	
Acetone	ug/L	100	75.6	76	48-146	
Acrylonitrile	ug/L	250	229	92	40-160	
Benzene	ug/L	50	51.2	102	80-125	
Bromochloromethane	ug/L	50	50.8	102	71-125	
Bromodichloromethane	ug/L	50	48.8	98	78-124	
Bromoform	ug/L	50	45.5	91	71-128	
Bromomethane	ug/L	50	40.7	81	40-160	
Carbon disulfide	ug/L	50	48.0	96	50-160	
Carbon tetrachloride	ug/L	50	48.2	96	69-131	
Chlorobenzene	ug/L	50	51.6	103	81-122	
Chloroethane	ug/L	50	50.8	102	39-148	
Chloroform	ug/L	50	46.8	94	73-127	
Chloromethane	ug/L	50	48.7	97	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.9	96	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.9	102	72-132	
Dibromochloromethane	ug/L	50	51.4	103	78-125	
Dibromomethane	ug/L	50	52.2	104	82-120	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

LABORATORY CONTROL SAMPLE: 1781002

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethylbenzene	ug/L	50	49.3	99	79-121	
Iodomethane	ug/L	100	93.4	93	39-154	
Methylene Chloride	ug/L	50	48.4	97	64-133	
Styrene	ug/L	50	53.1	106	84-126	
Tetrachloroethene	ug/L	50	51.6	103	78-122	
Toluene	ug/L	50	50.4	101	80-121	
trans-1,2-Dichloroethene	ug/L	50	48.8	98	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.1	96	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	70.2	140	40-160	
Trichloroethene	ug/L	50	52.3	105	78-122	
Trichlorofluoromethane	ug/L	50	48.6	97	53-137	
Vinyl acetate	ug/L	100	90.0	90	40-160	
Vinyl chloride	ug/L	50	49.1	98	58-137	
Xylene (Total)	ug/L	150	145	97	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			96	70-130	

MATRIX SPIKE SAMPLE: 1781004

Parameter	Units	92305246008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.3	107	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.7	103	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	22.6	113	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.2	106	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.8	109	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.9	99	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	22.8	114	70-130	
1,2-Dichloroethane	ug/L	ND	20	18.5	92	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.4	107	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.4	107	70-130	
2-Butanone (MEK)	ug/L	ND	40	43.8	110	70-130	
2-Hexanone	ug/L	ND	40	39.4	98	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.3	106	70-130	
Acetone	ug/L	ND	40	39.3	91	70-130	
Acrylonitrile	ug/L	ND	100	102	102	70-130	
Benzene	ug/L	ND	20	23.0	115	70-148	
Bromochloromethane	ug/L	ND	20	22.2	111	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	18.6	93	70-130	
Bromomethane	ug/L	ND	20	15.7	79	70-130	
Carbon disulfide	ug/L	ND	20	23.7	119	70-130	
Carbon tetrachloride	ug/L	ND	20	21.1	105	70-130	
Chlorobenzene	ug/L	ND	20	22.5	113	70-146	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

MATRIX SPIKE SAMPLE: 1781004

Parameter	Units	92305246008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	ND	20	22.6	113	70-130	
Chloroform	ug/L	ND	20	20.3	101	70-130	
Chloromethane	ug/L	ND	20	20.6	103	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.3	106	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.9	99	70-130	
Dibromochloromethane	ug/L	ND	20	19.9	100	70-130	
Dibromomethane	ug/L	ND	20	23.3	116	70-130	
Ethylbenzene	ug/L	ND	20	21.8	109	70-130	
Iodomethane	ug/L	ND	40	36.7	92	70-130	
Methylene Chloride	ug/L	ND	20	20.7	103	70-130	
Styrene	ug/L	ND	20	22.3	112	70-130	
Tetrachloroethene	ug/L	ND	20	21.8	109	70-130	
Toluene	ug/L	ND	20	22.9	115	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.7	108	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.3	97	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	15.9	79	70-130	
Trichloroethene	ug/L	ND	20	23.1	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	20.4	102	70-130	
Vinyl acetate	ug/L	ND	40	32.7	82	70-130	
Vinyl chloride	ug/L	ND	20	21.0	105	70-130	
1,2-Dichloroethane-d4 (S)	%				85	70-130	
4-Bromofluorobenzene (S)	%				103	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 1781003

Parameter	Units	92305246007 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

SAMPLE DUPLICATE: 1781003

Parameter	Units	92305246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	88	88	0		
4-Bromofluorobenzene (S)	%	104	103	1		
Toluene-d8 (S)	%	103	101	2		

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 321722 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

METHOD BLANK: 1782838 | Matrix: Water
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/19/16 15:54	

LABORATORY CONTROL SAMPLE: 1782839

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	276	110	90-110	

SAMPLE DUPLICATE: 1782840

Parameter	Units	92304628008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	369	366	1	5	

SAMPLE DUPLICATE: 1782841

Parameter	Units	92304962005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1410	1380	1	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: SW-2 **Lab ID: 92304962001** Collected: 07/12/16 09:30 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.411 (0.663)** **C:NA T:86%**	pCi/L	08/05/16 12:11	13982-63-3	
Radium-228	EPA 904.0	**0.674 ± 0.350 (0.613)** **C:78% T:88%**	pCi/L	08/04/16 01:31	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: SW-1 **Lab ID: 92304962002** Collected: 07/12/16 10:30 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.039 ± 0.506 (0.990) C:NA T:66%**	pCi/L	08/05/16 12:19	13982-63-3	
Radium-228	EPA 904.0	**0.0698 ± 0.353 (0.769) C:80% T:76%**	pCi/L	08/04/16 01:31	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: BG-1 **Lab ID: 92304962003** Collected: 07/12/16 11:15 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.777 ± 0.617 (0.801)** **C:NA T:92%**	pCi/L	08/05/16 12:27	13982-63-3	
Radium-228	EPA 904.0	**0.163 ± 0.293 (0.618)** **C:79% T:87%**	pCi/L	08/04/16 01:31	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-8 **Lab ID: 92304962004** Collected: 07/12/16 13:00 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.616 ± 0.570 (0.829)** **C:NA T:100%**	pCi/L	08/06/16 11:45	13982-63-3	
Radium-228	EPA 904.0	**0.548 ± 0.346 (0.640)** **C:80% T:81%**	pCi/L	08/04/16 01:31	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-1 **Lab ID: 92304962005** Collected: 07/12/16 14:50 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.448 ± 0.362 (0.202)** **C:NA T:102%**	pCi/L	08/06/16 11:59	13982-63-3	
Radium-228	EPA 904.0	**0.833 ± 0.382 (0.642)** **C:77% T:87%**	pCi/L	08/04/16 01:32	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-1-FD **Lab ID: 92304962006** Collected: 07/12/16 15:15 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.427 (0.926) C:NA T:97%**	pCi/L	08/06/16 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.194 ± 0.271 (0.563) C:82% T:90%**	pCi/L	08/04/16 01:32	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: MW-2 **Lab ID: 92304962007** Collected: 07/12/16 17:40 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.580 ± 0.542 (0.769)** **C:NA T:94%**	pCi/L	08/06/16 12:21	13982-63-3	
Radium-228	EPA 904.0	**0.980 ± 0.406 (0.651)** **C:78% T:85%**	pCi/L	08/04/16 01:32	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: AMB BLANK **Lab ID: 92304962008** Collected: 07/12/16 15:30 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.473 ± 0.382 (0.214)** **C:NA T:94%**	pCi/L	08/06/16 11:56	13982-63-3	
Radium-228	EPA 904.0	**0.534 ± 0.321 (0.580)** **C:74% T:85%**	pCi/L	08/05/16 01:08	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Sample: EQ BLANK **Lab ID: 92304962009** Collected: 07/12/16 19:00 Received: 07/13/16 08:12 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.180 ± 0.530 (0.981)** **C:NA T:97%**	pCi/L	08/06/16 12:20	13982-63-3	
Radium-228	EPA 904.0	**0.516 ± 0.305 (0.547)** **C:76% T:89%**	pCi/L	08/05/16 01:08	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 227841 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92304962001, 92304962002, 92304962003, 92304962004, 92304962005, 92304962006, 92304962007

METHOD BLANK: 1116108 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.614 ± 0.404 (0.763) C:85% T:72%	pCi/L	08/03/16 21:15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 227869 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92304962001, 92304962002, 92304962003

METHOD BLANK: 1116150 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.117 ± 0.537 (0.991) C:NA T:99%	pCi/L	08/05/16 12:46	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 227875 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92304962004, 92304962005, 92304962006, 92304962007, 92304962008, 92304962009

METHOD BLANK: 1116160 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0800 ± 0.415 (0.861) C:NA T:95%	pCi/L	08/06/16 11:40	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

QC Batch: 227847 | Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 | Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92304962008, 92304962009

METHOD BLANK: 1116114 | Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.159 ± 0.329 (0.707) C:84% T:89%	pCi/L	08/04/16 20:57	

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QUALIFIERS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92304962001	**SW-2**	EPA 300.0	321322		
92304962002	**SW-1**	EPA 300.0	321322		
92304962003	**BG-1**	EPA 300.0	321322		
92304962004	**MW-8**	EPA 300.0	321322		
92304962005	**MW-1**	EPA 300.0	321322		
92304962006	**MW-1-FD**	EPA 300.0	321322		
92304962007	**MW-2**	EPA 300.0	321322		
92304962008	**AMB BLANK**	EPA 300.0	321322		
92304962009	**EQ BLANK**	EPA 300.0	321322		
92304962001	**SW-2**	EPA 3010A	321270	EPA 6010	321581
92304962002	**SW-1**	EPA 3010A	321270	EPA 6010	321581
92304962003	**BG-1**	EPA 3010A	321270	EPA 6010	321581
92304962004	**MW-8**	EPA 3010A	321270	EPA 6010	321581
92304962005	**MW-1**	EPA 3010A	321270	EPA 6010	321581
92304962006	**MW-1-FD**	EPA 3010A	321270	EPA 6010	321581
92304962007	**MW-2**	EPA 3010A	321270	EPA 6010	321581
92304962008	**AMB BLANK**	EPA 3010A	321270	EPA 6010	321581
92304962009	**EQ BLANK**	EPA 3010A	321270	EPA 6010	321581
92304962001	**SW-2**	EPA 3020	425714	EPA 6020B	425867
92304962002	**SW-1**	EPA 3020	425714	EPA 6020B	425867
92304962003	**BG-1**	EPA 3020	425714	EPA 6020B	425867
92304962004	**MW-8**	EPA 3020	425714	EPA 6020B	425867
92304962005	**MW-1**	EPA 3020	425714	EPA 6020B	425867
92304962006	**MW-1-FD**	EPA 3020	425714	EPA 6020B	425867
92304962007	**MW-2**	EPA 3020	425714	EPA 6020B	425867
92304962008	**AMB BLANK**	EPA 3020	425714	EPA 6020B	425867
92304962009	**EQ BLANK**	EPA 3020	425714	EPA 6020B	425867
92304962001	**SW-2**	EPA 7470	321286	EPA 7470	321437
92304962002	**SW-1**	EPA 7470	321286	EPA 7470	321437
92304962003	**BG-1**	EPA 7470	321286	EPA 7470	321437
92304962004	**MW-8**	EPA 7470	321286	EPA 7470	321437
92304962005	**MW-1**	EPA 7470	321287	EPA 7470	321438
92304962006	**MW-1-FD**	EPA 7470	321287	EPA 7470	321438
92304962007	**MW-2**	EPA 7470	321287	EPA 7470	321438
92304962008	**AMB BLANK**	EPA 7470	321287	EPA 7470	321438
92304962009	**EQ BLANK**	EPA 7470	321287	EPA 7470	321438
92304962001	**SW-2**	EPA 8260	321246		
92304962002	**SW-1**	EPA 8260	321246		
92304962003	**BG-1**	EPA 8260	321369		
92304962004	**MW-8**	EPA 8260	321369		
92304962005	**MW-1**	EPA 8260	321369		
92304962006	**MW-1-FD**	EPA 8260	321369		
92304962007	**MW-2**	EPA 8260	321369		
92304962008	**AMB BLANK**	EPA 8260	321369		
92304962009	**EQ BLANK**	EPA 8260	321369		
92304962010	**TRIP BLANK**	EPA 8260	321369		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92304962

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92304962001	**SW-2**	EPA 903.1	227869		
92304962002	**SW-1**	EPA 903.1	227869		
92304962003	**BG-1**	EPA 903.1	227869		
92304962004	**MW-8**	EPA 903.1	227875		
92304962005	**MW-1**	EPA 903.1	227875		
92304962006	**MW-1-FD**	EPA 903.1	227875		
92304962007	**MW-2**	EPA 903.1	227875		
92304962008	**AMB BLANK**	EPA 903.1	227875		
92304962009	**EQ BLANK**	EPA 903.1	227875		
92304962001	**SW-2**	EPA 904.0	227841		
92304962002	**SW-1**	EPA 904.0	227841		
92304962003	**BG-1**	EPA 904.0	227841		
92304962004	**MW-8**	EPA 904.0	227841		
92304962005	**MW-1**	EPA 904.0	227841		
92304962006	**MW-1-FD**	EPA 904.0	227841		
92304962007	**MW-2**	EPA 904.0	227841		
92304962008	**AMB BLANK**	EPA 904.0	227847		
92304962009	**EQ BLANK**	EPA 904.0	227847		
92304962001	**SW-2**	SM 2540C	321722		
92304962002	**SW-1**	SM 2540C	321722		
92304962003	**BG-1**	SM 2540C	321722		
92304962004	**MW-8**	SM 2540C	321722		
92304962005	**MW-1**	SM 2540C	321722		
92304962006	**MW-1-FD**	SM 2540C	321722		
92304962007	**MW-2**	SM 2540C	321722		
92304962008	**AMB BLANK**	SM 2540C	321722		
92304962009	**EQ BLANK**	SM 2540C	321722		

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Pace Analytical®	Document Name: **Sample Condition Upon Receipt(SCUR)**	Document Revised:April 25, 2016 Page 1 of 2
	Document No.: **F-CHR-CS-003-rev.19**	Issuing Authority: Pace Huntersville Quality Office

WO# : 92304962

92304962

Sample Condition Upon Receipt

Client Name: Charah

Project #:

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: DM 7/13

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:____

Thermometer: T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 6.0 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNO3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	☐ Yes	☐ No	☑ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	12.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	13.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):____				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: ____ Date/Time: ____

Comments/Sample Discrepancy: ____

Project Manager SCURF Review: JJ **Date:** 7/14/16

Project Manager SRF Review: JJ **Date:** 7/14/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995526

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Charah - Brickhaven	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name:	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #: 7672

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	RAD	8260	Metals	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92304862
1	SW-2					07/12/16	0930		11										3	3	2	1	1	1		001
2	SW-1					07/12/16	1030		11										3	3	2	1	1	1		002
3	BG-1					07/12/16	1115		11										3	3	2	1	1	1		003
4	MW-8					07/12/16	1300		11										3	3	2	1	1	1		004
5	MW-1					07/12/16	1450		11										3	3	2	1	1	1		005
6	MW-1-FD					07/12/16	1515		11										3	3	2	1	1	1		006
7	MW-2					07/12/16	1740		11										3	3	2	1	1	1		007
8	Trip Blank					07/12/16	0800		2											2						010
9	AMB Blank					07/12/16	1530		11										3	3	2	1	1	1		008
10	EQ. Blank					07/12/16	1900		11										3	3	2	1	1	1		009
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	07/12/16	1900	Clint Sorrell Pace	7/13	0812				
	Clint Sorrell Pace	7/13	1351	Jmore / Pace HVL	7-13	1351	1.6	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 07/12/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 16, 2016

Sean Quarry
HDR
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on July 14, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

cc: Mike Plummer, HDR

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CERTIFICATIONS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

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CERTIFICATIONS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Greenwood Certification IDs

816 Durst Avenue East, Greenwood, SC 29649
South Carolina Laboratory ID #: 24562
North Carolina Divison of Water Resources Certification number 25
Florida Certification number E87633
Virginia VELAP ID: 460250
Asbestos NVLAP accreditation: 101410-0

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SAMPLE SUMMARY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92305243001	**MW-4**	Water	07/13/16 11:10	07/14/16 07:56
92305243002	**AMB BLANK**	Water	07/13/16 10:30	07/14/16 07:56
92305243003	**EQ. BLANK**	Water	07/13/16 11:00	07/14/16 07:56
92305243004	**TRIP BLANK**	Water	07/13/16 08:30	07/14/16 07:56

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SAMPLE ANALYTE COUNT

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92305243001	**MW-4**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92305243002	**AMB BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92305243003	**EQ. BLANK**	EPA 300.0	CDC	3	PASI-W
		EPA 6010	SH1	17	PASI-A
		EPA 6020B	RJS	2	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	ALC	1	PASI-A
92305243004	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

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SUMMARY OF DETECTION

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92305243001	**MW-4**					
EPA 300.0	Chloride	423	mg/L	8.0	07/21/16 02:03	
EPA 300.0	Fluoride	0.34	mg/L	0.10	07/20/16 19:27	
EPA 300.0	Sulfate	9.2	mg/L	1.0	07/20/16 19:27	
EPA 6010	Barium	257	ug/L	5.0	07/20/16 12:43	
EPA 6010	Calcium	53500	ug/L	100	07/20/16 12:43	
EPA 6020B	Boron	5.8	ug/L	5.0	08/16/16 08:19	
EPA 6020B	Lithium	24.7	ug/L	0.50	08/16/16 08:19	
EPA 903.1	Radium-226	0.185 ± 0.560 (1.00) C:NA T:93%	pCi/L		08/07/16 12:14	
EPA 904.0	Radium-228	0.455 ± 0.337 (0.654) C:72% T:90%	pCi/L		08/04/16 15:59	
SM 2540C	Total Dissolved Solids	1040	mg/L	125	07/20/16 10:19	
92305243002	**AMB BLANK**					
EPA 8260	2-Butanone (MEK)	5.6	ug/L	5.0	07/15/16 15:20	
EPA 903.1	Radium-226	0.149 ± 0.462 (0.894) C:NA T:91%	pCi/L		08/07/16 12:54	
EPA 904.0	Radium-228	-0.0586 ± 0.318 (0.760) C:71% T:80%	pCi/L		08/04/16 15:59	
92305243003	**EQ. BLANK**					
EPA 8260	2-Butanone (MEK)	5.6	ug/L	5.0	07/15/16 15:37	
EPA 903.1	Radium-226	-0.238 ± 0.363 (0.953) C:NA T:90%	pCi/L		08/07/16 12:42	
EPA 904.0	Radium-228	0.415 ± 0.336 (0.661) C:74% T:81%	pCi/L		08/04/16 15:59	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: MW-4 **Lab ID: 92305243001** Collected: 07/13/16 11:10 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	**423**	mg/L	8.0	8		07/21/16 02:03	16887-00-6	
Fluoride	**0.34**	mg/L	0.10	1		07/20/16 19:27	16984-48-8	
Sulfate	**9.2**	mg/L	1.0	1		07/20/16 19:27	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:43	7440-38-2	
Barium	**257**	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/18/16 20:20	07/20/16 12:43	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/18/16 20:20	07/20/16 12:43	7440-43-9	
Calcium	**53500**	ug/L	100	1	07/18/16 20:20	07/20/16 12:43	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-48-4	
Copper	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-50-8	
Lead	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:43	7782-49-2	
Silver	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/18/16 20:20	07/20/16 12:43	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:43	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:43	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**5.8**	ug/L	5.0	1	08/15/16 08:48	08/16/16 08:19	7440-42-8	
Lithium	**24.7**	ug/L	0.50	1	08/15/16 08:48	08/16/16 08:19	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/20/16 05:11	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 17:36	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 17:36	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 17:36	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 17:36	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 17:36	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 17:36	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 17:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 17:36	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 17:36	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 17:36	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 17:36	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 17:36	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 17:36	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 17:36	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 17:36	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: MW-4 **Lab ID: 92305243001** Collected: 07/13/16 11:10 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 17:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 17:36	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 17:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 17:36	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 17:36	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 17:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 17:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 17:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 17:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 17:36	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 17:36	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 17:36	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 17:36	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 17:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 17:36	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 17:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 17:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 17:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 17:36	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 17:36	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 17:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 17:36	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 17:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 17:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 17:36	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 17:36	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 17:36	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 17:36	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		07/15/16 17:36	460-00-4	
1,2-Dichloroethane-d4 (S)	84	%	70-130	1		07/15/16 17:36	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/15/16 17:36	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1040**	mg/L	125	1		07/20/16 10:19		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: AMB BLANK **Lab ID: 92305243002** Collected: 07/13/16 10:30 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		07/20/16 19:49	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/20/16 19:49	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/20/16 19:49	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:53	7440-38-2	
Barium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/18/16 20:20	07/20/16 12:53	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/18/16 20:20	07/20/16 12:53	7440-43-9	
Calcium	ND	ug/L	100	1	07/18/16 20:20	07/20/16 12:53	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-48-4	
Copper	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-50-8	
Lead	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:53	7782-49-2	
Silver	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/18/16 20:20	07/20/16 12:53	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:53	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:53	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	08/15/16 08:48	08/16/16 08:10	7440-42-8	
Lithium	ND	ug/L	0.50	1	08/15/16 08:48	08/16/16 08:10	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/20/16 05:14	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 15:20	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 15:20	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 15:20	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 15:20	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 15:20	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 15:20	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 15:20	74-83-9	
2-Butanone (MEK)	**5.6**	ug/L	5.0	1		07/15/16 15:20	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 15:20	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 15:20	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 15:20	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 15:20	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 15:20	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 15:20	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 15:20	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: AMB BLANK **Lab ID: 92305243002** Collected: 07/13/16 10:30 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 15:20	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:20	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:20	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 15:20	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:20	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:20	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:20	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:20	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 15:20	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:20	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 15:20	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 15:20	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 15:20	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 15:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 15:20	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 15:20	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:20	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:20	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 15:20	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 15:20	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:20	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 15:20	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 15:20	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 15:20	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 15:20	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 15:20	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 15:20	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		07/15/16 15:20	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	70-130	1		07/15/16 15:20	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		07/15/16 15:20	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		07/20/16 10:19		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: EQ. BLANK **Lab ID: 92305243003** Collected: 07/13/16 11:00 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
3000 IC Anions 28 Days, GWD	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		07/20/16 20:11	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/20/16 20:11	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/20/16 20:11	14808-79-8	
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:56	7440-38-2	
Barium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/18/16 20:20	07/20/16 12:56	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/18/16 20:20	07/20/16 12:56	7440-43-9	
Calcium	ND	ug/L	100	1	07/18/16 20:20	07/20/16 12:56	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-48-4	
Copper	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-50-8	
Lead	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:56	7782-49-2	
Silver	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-22-4	
Thallium	ND	ug/L	5.4	1	07/18/16 20:20	07/20/16 12:56	7440-28-0	
Vanadium	ND	ug/L	5.0	1	07/18/16 20:20	07/20/16 12:56	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/18/16 20:20	07/20/16 12:56	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	08/15/16 08:48	08/16/16 08:14	7440-42-8	
Lithium	ND	ug/L	0.50	1	08/15/16 08:48	08/16/16 08:14	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	07/15/16 15:00	07/20/16 05:16	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 15:37	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 15:37	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 15:37	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 15:37	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 15:37	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 15:37	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 15:37	74-83-9	
2-Butanone (MEK)	**5.6**	ug/L	5.0	1		07/15/16 15:37	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 15:37	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 15:37	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 15:37	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 15:37	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 15:37	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 15:37	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 15:37	124-48-1	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: EQ. BLANK **Lab ID: 92305243003** Collected: 07/13/16 11:00 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Dibromomethane	ND	ug/L	1.0	1		07/15/16 15:37	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:37	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:37	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 15:37	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:37	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:37	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:37	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:37	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:37	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 15:37	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:37	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:37	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 15:37	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 15:37	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 15:37	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 15:37	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 15:37	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 15:37	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:37	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:37	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 15:37	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 15:37	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:37	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:37	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 15:37	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 15:37	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 15:37	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 15:37	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 15:37	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 15:37	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	104	%	70-130	1		07/15/16 15:37	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/15/16 15:37	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/15/16 15:37	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		07/20/16 10:20		

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: TRIP BLANK **Lab ID: 92305243004** Collected: 07/13/16 08:30 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		07/15/16 15:54	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/15/16 15:54	107-13-1	
Benzene	ND	ug/L	1.0	1		07/15/16 15:54	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/15/16 15:54	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/15/16 15:54	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/15/16 15:54	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/15/16 15:54	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/15/16 15:54	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/15/16 15:54	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/15/16 15:54	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/15/16 15:54	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/15/16 15:54	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/15/16 15:54	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/15/16 15:54	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/15/16 15:54	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/15/16 15:54	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:54	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/15/16 15:54	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/15/16 15:54	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:54	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/15/16 15:54	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:54	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:54	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/15/16 15:54	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/15/16 15:54	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:54	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/15/16 15:54	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/15/16 15:54	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/15/16 15:54	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/15/16 15:54	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/15/16 15:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/15/16 15:54	108-10-1	
Styrene	ND	ug/L	1.0	1		07/15/16 15:54	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:54	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/15/16 15:54	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/15/16 15:54	127-18-4	
Toluene	ND	ug/L	1.0	1		07/15/16 15:54	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:54	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/15/16 15:54	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/15/16 15:54	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/15/16 15:54	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/15/16 15:54	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/15/16 15:54	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/15/16 15:54	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/15/16 15:54	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	101	%	70-130	1		07/15/16 15:54	460-00-4	

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ANALYTICAL RESULTS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: TRIP BLANK **Lab ID: 92305243004** Collected: 07/13/16 08:30 Received: 07/14/16 07:56 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%	70-130	1		07/15/16 15:54	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		07/15/16 15:54	2037-26-5	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 322028 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 3000 IC Anions, GWD
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 1784552 | Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/20/16 09:49	
Fluoride	mg/L	ND	0.10	07/20/16 09:49	
Sulfate	mg/L	ND	1.0	07/20/16 09:49	

LABORATORY CONTROL SAMPLE: 1784553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	52.5	105	90-110	
Fluoride	mg/L	2.5	2.7	108	90-110	
Sulfate	mg/L	50	53.5	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784554 1784555

Parameter	Units	92304863002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.5	50	50	60.5	56.6	108	100	90-110	7	20	
Fluoride	mg/L	0.082J	2.5	2.5	2.7	2.5	103	96	90-110	7	20	
Sulfate	mg/L	187	50	50	225	235	76	95	90-110	4	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1784556 1784557

Parameter	Units	92305067001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.0	50	50	53.7	54.0	102	102	90-110	1	20	
Fluoride	mg/L	0.21	2.5	2.5	2.6	2.6	97	97	90-110	0	20	
Sulfate	mg/L	7.9	50	50	59.0	59.3	102	103	90-110	0	20	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 321288 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 1780628 | Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/20/16 04:59	

LABORATORY CONTROL SAMPLE: 1780629

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780630 1780631

Parameter	Units	92305100009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.0	96	78	75-125	21	25	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 321452 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 1781562 | Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/20/16 12:37	
Arsenic	ug/L	ND	10.0	07/20/16 12:37	
Barium	ug/L	ND	5.0	07/20/16 12:37	
Beryllium	ug/L	ND	1.0	07/20/16 12:37	
Cadmium	ug/L	ND	1.0	07/20/16 12:37	
Calcium	ug/L	ND	100	07/20/16 12:37	
Chromium	ug/L	ND	5.0	07/20/16 12:37	
Cobalt	ug/L	ND	5.0	07/20/16 12:37	
Copper	ug/L	ND	5.0	07/20/16 12:37	
Lead	ug/L	ND	5.0	07/20/16 12:37	
Molybdenum	ug/L	ND	5.0	07/20/16 12:37	
Nickel	ug/L	ND	5.0	07/20/16 12:37	
Selenium	ug/L	ND	10.0	07/20/16 12:37	
Silver	ug/L	ND	5.0	07/20/16 12:37	
Thallium	ug/L	ND	5.4	07/20/16 12:37	
Vanadium	ug/L	ND	5.0	07/20/16 12:37	
Zinc	ug/L	ND	10.0	07/20/16 12:37	

LABORATORY CONTROL SAMPLE: 1781563

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	500	100	80-120	
Arsenic	ug/L	500	485	97	80-120	
Barium	ug/L	500	490	98	80-120	
Beryllium	ug/L	500	494	99	80-120	
Cadmium	ug/L	500	495	99	80-120	
Calcium	ug/L	5000	4840	97	80-120	
Chromium	ug/L	500	485	97	80-120	
Cobalt	ug/L	500	493	99	80-120	
Copper	ug/L	500	499	100	80-120	
Lead	ug/L	500	491	98	80-120	
Molybdenum	ug/L	500	514	103	80-120	
Nickel	ug/L	500	491	98	80-120	
Selenium	ug/L	500	489	98	80-120	
Silver	ug/L	250	247	99	80-120	
Thallium	ug/L	500	492	98	80-120	
Vanadium	ug/L	500	489	98	80-120	
Zinc	ug/L	500	484	97	80-120	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1781564 1781565

Parameter	Units	92305243001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	498	502	99	100	75-125	1	25	
Arsenic	ug/L	ND	500	500	498	497	100	99	75-125	0	25	
Barium	ug/L	257	500	500	743	738	97	96	75-125	1	25	
Beryllium	ug/L	ND	500	500	497	496	99	99	75-125	0	25	
Cadmium	ug/L	ND	500	500	492	494	98	99	75-125	1	25	
Calcium	ug/L	53500	5000	5000	58600	58400	104	98	75-125	0	25	
Chromium	ug/L	ND	500	500	481	487	96	97	75-125	1	25	
Cobalt	ug/L	ND	500	500	470	474	94	95	75-125	1	25	
Copper	ug/L	ND	500	500	492	496	98	99	75-125	1	25	
Lead	ug/L	ND	500	500	461	463	92	93	75-125	0	25	
Molybdenum	ug/L	ND	500	500	511	516	102	103	75-125	1	25	
Nickel	ug/L	ND	500	500	468	474	93	94	75-125	1	25	
Selenium	ug/L	ND	500	500	482	488	96	97	75-125	1	25	
Silver	ug/L	ND	250	250	244	246	97	98	75-125	1	25	
Thallium	ug/L	ND	500	500	447	448	89	89	75-125	0	25	
Vanadium	ug/L	ND	500	500	492	499	98	100	75-125	1	25	
Zinc	ug/L	ND	500	500	476	484	94	96	75-125	2	25	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 430511 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 | Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 2342182 | Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	08/16/16 08:00	
Lithium	ug/L	ND	0.50	08/16/16 08:00	

LABORATORY CONTROL SAMPLE: 2342183

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	100	100	80-120	
Lithium	ug/L	100	100	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2342184 2342185

Parameter	Units	92305243001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	5.8	100	100	101	105	95	99	75-125	4	20	
Lithium	ug/L	24.7	100	100	126	126	101	101	75-125	0	20	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 321369 | Analysis Method: EPA 8260
QC Batch Method: EPA 8260 | Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92305243001, 92305243002, 92305243003, 92305243004

METHOD BLANK: 1781001 | Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003, 92305243004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1,1-Trichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1,2-Trichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1-Dichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,1-Dichloroethene	ug/L	ND	1.0	07/15/16 13:22	
1,2,3-Trichloropropane	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichlorobenzene	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichloroethane	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichloropropane	ug/L	ND	1.0	07/15/16 13:22	
1,4-Dichlorobenzene	ug/L	ND	1.0	07/15/16 13:22	
2-Butanone (MEK)	ug/L	ND	5.0	07/15/16 13:22	
2-Hexanone	ug/L	ND	5.0	07/15/16 13:22	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	07/15/16 13:22	
Acetone	ug/L	ND	25.0	07/15/16 13:22	
Acrylonitrile	ug/L	ND	10.0	07/15/16 13:22	
Benzene	ug/L	ND	1.0	07/15/16 13:22	
Bromochloromethane	ug/L	ND	1.0	07/15/16 13:22	
Bromodichloromethane	ug/L	ND	1.0	07/15/16 13:22	
Bromoform	ug/L	ND	1.0	07/15/16 13:22	
Bromomethane	ug/L	ND	2.0	07/15/16 13:22	
Carbon disulfide	ug/L	ND	2.0	07/15/16 13:22	
Carbon tetrachloride	ug/L	ND	1.0	07/15/16 13:22	
Chlorobenzene	ug/L	ND	1.0	07/15/16 13:22	
Chloroethane	ug/L	ND	1.0	07/15/16 13:22	
Chloroform	ug/L	ND	1.0	07/15/16 13:22	
Chloromethane	ug/L	ND	1.0	07/15/16 13:22	
cis-1,2-Dichloroethene	ug/L	ND	1.0	07/15/16 13:22	
cis-1,3-Dichloropropene	ug/L	ND	1.0	07/15/16 13:22	
Dibromochloromethane	ug/L	ND	1.0	07/15/16 13:22	
Dibromomethane	ug/L	ND	1.0	07/15/16 13:22	
Ethylbenzene	ug/L	ND	1.0	07/15/16 13:22	
Iodomethane	ug/L	ND	5.0	07/15/16 13:22	
Methylene Chloride	ug/L	ND	1.0	07/15/16 13:22	
Styrene	ug/L	ND	1.0	07/15/16 13:22	
Tetrachloroethene	ug/L	ND	1.0	07/15/16 13:22	
Toluene	ug/L	ND	1.0	07/15/16 13:22	
trans-1,2-Dichloroethene	ug/L	ND	1.0	07/15/16 13:22	
trans-1,3-Dichloropropene	ug/L	ND	1.0	07/15/16 13:22	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	07/15/16 13:22	
Trichloroethene	ug/L	ND	1.0	07/15/16 13:22	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

METHOD BLANK: 1781001 Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003, 92305243004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	07/15/16 13:22	
Vinyl acetate	ug/L	ND	2.0	07/15/16 13:22	
Vinyl chloride	ug/L	ND	1.0	07/15/16 13:22	
Xylene (Total)	ug/L	ND	1.0	07/15/16 13:22	
1,2-Dichloroethane-d4 (S)	%	84	70-130	07/15/16 13:22	
4-Bromofluorobenzene (S)	%	102	70-130	07/15/16 13:22	
Toluene-d8 (S)	%	100	70-130	07/15/16 13:22	

LABORATORY CONTROL SAMPLE: 1781002

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	53.0	106	80-125	
1,1,1-Trichloroethane	ug/L	50	46.4	93	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	48.0	96	79-124	
1,1,2-Trichloroethane	ug/L	50	51.4	103	85-125	
1,1-Dichloroethane	ug/L	50	47.7	95	73-126	
1,1-Dichloroethene	ug/L	50	47.4	95	66-135	
1,2,3-Trichloropropane	ug/L	50	47.2	94	75-130	
1,2-Dichlorobenzene	ug/L	50	52.6	105	80-133	
1,2-Dichloroethane	ug/L	50	41.9	84	67-128	
1,2-Dichloropropane	ug/L	50	48.3	97	75-132	
1,4-Dichlorobenzene	ug/L	50	50.3	101	78-130	
2-Butanone (MEK)	ug/L	100	86.9	87	61-144	
2-Hexanone	ug/L	100	84.5	84	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	91.4	91	72-135	
Acetone	ug/L	100	75.6	76	48-146	
Acrylonitrile	ug/L	250	229	92	40-160	
Benzene	ug/L	50	51.2	102	80-125	
Bromochloromethane	ug/L	50	50.8	102	71-125	
Bromodichloromethane	ug/L	50	48.8	98	78-124	
Bromoform	ug/L	50	45.5	91	71-128	
Bromomethane	ug/L	50	40.7	81	40-160	
Carbon disulfide	ug/L	50	48.0	96	50-160	
Carbon tetrachloride	ug/L	50	48.2	96	69-131	
Chlorobenzene	ug/L	50	51.6	103	81-122	
Chloroethane	ug/L	50	50.8	102	39-148	
Chloroform	ug/L	50	46.8	94	73-127	
Chloromethane	ug/L	50	48.7	97	44-146	
cis-1,2-Dichloroethene	ug/L	50	47.9	96	74-124	
cis-1,3-Dichloropropene	ug/L	50	50.9	102	72-132	
Dibromochloromethane	ug/L	50	51.4	103	78-125	
Dibromomethane	ug/L	50	52.2	104	82-120	
Ethylbenzene	ug/L	50	49.3	99	79-121	
Iodomethane	ug/L	100	93.4	93	39-154	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

LABORATORY CONTROL SAMPLE: 1781002

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	48.4	97	64-133	
Styrene	ug/L	50	53.1	106	84-126	
Tetrachloroethene	ug/L	50	51.6	103	78-122	
Toluene	ug/L	50	50.4	101	80-121	
trans-1,2-Dichloroethene	ug/L	50	48.8	98	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.1	96	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	70.2	140	40-160	
Trichloroethene	ug/L	50	52.3	105	78-122	
Trichlorofluoromethane	ug/L	50	48.6	97	53-137	
Vinyl acetate	ug/L	100	90.0	90	40-160	
Vinyl chloride	ug/L	50	49.1	98	58-137	
Xylene (Total)	ug/L	150	145	97	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			104	70-130	
Toluene-d8 (S)	%			96	70-130	

MATRIX SPIKE SAMPLE: 1781004

Parameter	Units	92305246008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	21.3	107	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.7	103	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	22.6	113	70-130	
1,1-Dichloroethane	ug/L	ND	20	21.2	106	70-130	
1,1-Dichloroethene	ug/L	ND	20	21.8	109	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	19.9	99	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	22.8	114	70-130	
1,2-Dichloroethane	ug/L	ND	20	18.5	92	70-130	
1,2-Dichloropropane	ug/L	ND	20	21.4	107	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.4	107	70-130	
2-Butanone (MEK)	ug/L	ND	40	43.8	110	70-130	
2-Hexanone	ug/L	ND	40	39.4	98	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.3	106	70-130	
Acetone	ug/L	ND	40	39.3	91	70-130	
Acrylonitrile	ug/L	ND	100	102	102	70-130	
Benzene	ug/L	ND	20	23.0	115	70-148	
Bromochloromethane	ug/L	ND	20	22.2	111	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	18.6	93	70-130	
Bromomethane	ug/L	ND	20	15.7	79	70-130	
Carbon disulfide	ug/L	ND	20	23.7	119	70-130	
Carbon tetrachloride	ug/L	ND	20	21.1	105	70-130	
Chlorobenzene	ug/L	ND	20	22.5	113	70-146	
Chloroethane	ug/L	ND	20	22.6	113	70-130	
Chloroform	ug/L	ND	20	20.3	101	70-130	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

MATRIX SPIKE SAMPLE: 1781004

Parameter	Units	92305246008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	20.6	103	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	21.3	106	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.9	99	70-130	
Dibromochloromethane	ug/L	ND	20	19.9	100	70-130	
Dibromomethane	ug/L	ND	20	23.3	116	70-130	
Ethylbenzene	ug/L	ND	20	21.8	109	70-130	
Iodomethane	ug/L	ND	40	36.7	92	70-130	
Methylene Chloride	ug/L	ND	20	20.7	103	70-130	
Styrene	ug/L	ND	20	22.3	112	70-130	
Tetrachloroethene	ug/L	ND	20	21.8	109	70-130	
Toluene	ug/L	ND	20	22.9	115	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	21.7	108	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	19.3	97	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	15.9	79	70-130	
Trichloroethene	ug/L	ND	20	23.1	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	20.4	102	70-130	
Vinyl acetate	ug/L	ND	40	32.7	82	70-130	
Vinyl chloride	ug/L	ND	20	21.0	105	70-130	
1,2-Dichloroethane-d4 (S)	%				85	70-130	
4-Bromofluorobenzene (S)	%				103	70-130	
Toluene-d8 (S)	%				99	70-130	

SAMPLE DUPLICATE: 1781003

Parameter	Units	92305246007 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,1-Trichloroethane	ug/L	ND	ND		30	
1,1,2,2-Tetrachloroethane	ug/L	ND	ND		30	
1,1,2-Trichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethane	ug/L	ND	ND		30	
1,1-Dichloroethene	ug/L	ND	ND		30	
1,2,3-Trichloropropane	ug/L	ND	ND		30	
1,2-Dichlorobenzene	ug/L	ND	ND		30	
1,2-Dichloroethane	ug/L	ND	ND		30	
1,2-Dichloropropane	ug/L	ND	ND		30	
1,4-Dichlorobenzene	ug/L	ND	ND		30	
2-Butanone (MEK)	ug/L	ND	ND		30	
2-Hexanone	ug/L	ND	ND		30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	ND		30	
Acetone	ug/L	ND	ND		30	
Acrylonitrile	ug/L	ND	ND		30	
Benzene	ug/L	ND	ND		30	
Bromochloromethane	ug/L	ND	ND		30	
Bromodichloromethane	ug/L	ND	ND		30	
Bromoform	ug/L	ND	ND		30	

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

SAMPLE DUPLICATE: 1781003

Parameter	Units	92305246007 Result	Dup Result	RPD	Max RPD	Qualifiers
Bromomethane	ug/L	ND	ND		30	
Carbon disulfide	ug/L	ND	ND		30	
Carbon tetrachloride	ug/L	ND	ND		30	
Chlorobenzene	ug/L	ND	ND		30	
Chloroethane	ug/L	ND	ND		30	
Chloroform	ug/L	ND	ND		30	
Chloromethane	ug/L	ND	ND		30	
cis-1,2-Dichloroethene	ug/L	ND	ND		30	
cis-1,3-Dichloropropene	ug/L	ND	ND		30	
Dibromochloromethane	ug/L	ND	ND		30	
Dibromomethane	ug/L	ND	ND		30	
Ethylbenzene	ug/L	ND	ND		30	
Iodomethane	ug/L	ND	ND		30	
Methylene Chloride	ug/L	ND	ND		30	
Styrene	ug/L	ND	ND		30	
Tetrachloroethene	ug/L	ND	ND		30	
Toluene	ug/L	ND	ND		30	
trans-1,2-Dichloroethene	ug/L	ND	ND		30	
trans-1,3-Dichloropropene	ug/L	ND	ND		30	
trans-1,4-Dichloro-2-butene	ug/L	ND	ND		30	
Trichloroethene	ug/L	ND	ND		30	
Trichlorofluoromethane	ug/L	ND	ND		30	
Vinyl acetate	ug/L	ND	ND		30	
Vinyl chloride	ug/L	ND	ND		30	
Xylene (Total)	ug/L	ND	ND		30	
1,2-Dichloroethane-d4 (S)	%	88	88	0		
4-Bromofluorobenzene (S)	%	104	103	1		
Toluene-d8 (S)	%	103	101	2		

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QUALITY CONTROL DATA

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 321829 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 1783314 | Matrix: Water
Associated Lab Samples: 92305243001, 92305243002, 92305243003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/20/16 10:05	

LABORATORY CONTROL SAMPLE: 1783315

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	270	108	90-110	

SAMPLE DUPLICATE: 1783316

Parameter	Units	92305064001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	754	747	1	5	

SAMPLE DUPLICATE: 1783317

Parameter	Units	92305069001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	594	570	4	5	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: MW-4 **Lab ID: 92305243001** Collected: 07/13/16 11:10 Received: 07/14/16 07:56 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.185 ± 0.560 (1.00) C:NA T:93%**	pCi/L	08/07/16 12:14	13982-63-3	
Radium-228	EPA 904.0	**0.455 ± 0.337 (0.654) C:72% T:90%**	pCi/L	08/04/16 15:59	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: AMB BLANK **Lab ID: 92305243002** Collected: 07/13/16 10:30 Received: 07/14/16 07:56 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.149 ± 0.462 (0.894)** **C:NA T:91%**	pCi/L	08/07/16 12:54	13982-63-3	
Radium-228	EPA 904.0	**-0.0586 ± 0.318 (0.760)** **C:71% T:80%**	pCi/L	08/04/16 15:59	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Sample: EQ. BLANK **Lab ID: 92305243003** Collected: 07/13/16 11:00 Received: 07/14/16 07:56 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.238 ± 0.363 (0.953) C:NA T:90%**	pCi/L	08/07/16 12:42	13982-63-3	
Radium-228	EPA 904.0	**0.415 ± 0.336 (0.661) C:74% T:81%**	pCi/L	08/04/16 15:59	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 227876 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 1116161 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.211 ± 0.441 (0.991) C:NA T:96%	pCi/L	08/06/16 12:59	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

QC Batch: 227849 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92305243001, 92305243002, 92305243003

METHOD BLANK: 1116116 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.104 ± 0.292 (0.658) C:77% T:76%	pCi/L	08/04/16 15:56	

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QUALIFIERS

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg
PASI-W	Pace Analytical Services - Greenwood

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARAH- BRICKHAVEN
Pace Project No.: 92305243

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92305243001	**MW-4**	EPA 300.0	322028		
92305243002	**AMB BLANK**	EPA 300.0	322028		
92305243003	**EQ. BLANK**	EPA 300.0	322028		
92305243001	**MW-4**	EPA 3010A	321452	EPA 6010	321630
92305243002	**AMB BLANK**	EPA 3010A	321452	EPA 6010	321630
92305243003	**EQ. BLANK**	EPA 3010A	321452	EPA 6010	321630
92305243001	**MW-4**	EPA 3020	430511	EPA 6020B	430591
92305243002	**AMB BLANK**	EPA 3020	430511	EPA 6020B	430591
92305243003	**EQ. BLANK**	EPA 3020	430511	EPA 6020B	430591
92305243001	**MW-4**	EPA 7470	321288	EPA 7470	321439
92305243002	**AMB BLANK**	EPA 7470	321288	EPA 7470	321439
92305243003	**EQ. BLANK**	EPA 7470	321288	EPA 7470	321439
92305243001	**MW-4**	EPA 8260	321369		
92305243002	**AMB BLANK**	EPA 8260	321369		
92305243003	**EQ. BLANK**	EPA 8260	321369		
92305243004	**TRIP BLANK**	EPA 8260	321369		
92305243001	**MW-4**	EPA 903.1	227876		
92305243002	**AMB BLANK**	EPA 903.1	227876		
92305243003	**EQ. BLANK**	EPA 903.1	227876		
92305243001	**MW-4**	EPA 904.0	227849		
92305243002	**AMB BLANK**	EPA 904.0	227849		
92305243003	**EQ. BLANK**	EPA 904.0	227849		
92305243001	**MW-4**	SM 2540C	321829		
92305243002	**AMB BLANK**	SM 2540C	321829		
92305243003	**EQ. BLANK**	SM 2540C	321829		

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Page 2 of 2 for Internal Use ONLY

Sample Condition Upon Receipt

Client Name: Cherah

Project #: **WO# : 92305243**

92305243

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:_____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: DM 7/14

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:_____

Thermometer: T1505 **Type of Ice:** ☑ Wet ☐ Blue ☐ None ☑ Samples on ice, cooling process has begun

Correction Factor: 0.0°C **Cooler Temp Corrected (°C):** 0.1 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	10. HNC3 pH<2
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☑ Yes	☐ No	☐ N/A	HCl pH<2 H2SO4 pH<2 NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	☑ Yes	☐ No	☐ N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	☐ Yes	☑ No	☐ N/A	11.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	12.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	13.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☐ N/A	
Pace Trip Blank Lot # (if purchased):_____				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: TC **Date:** 7/15/16

Project Manager SRF Review: TC **Date:** 7/15/16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: of

1995527

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Charah - Brickhaven	Report To:	Attention:
Address:	Copy To:	Company Name:
		Address:
Email To:	Purchase Order No.:	Pace Quote Reference:
Phone: Fax:	Project Name: Brickhaven	Pace Project Manager:
Requested Due Date/TAT:	Project Number:	Pace Profile #:

REGULATORY AGENCY

- NPDES
- ✓ GROUND WATER
- DRINKING WATER
- UST
- RCRA
- OTHER

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	8260	RAD	Metals	TDS	Fluoride	Chloride/Sulfate	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92305243
1	MW-4					07/13/16	1110		11										3	3	2	1	1	1		001
2																										
3	AMB Blank					07/13/16	1030		11										3	3	2	1	1	1		002
4	EQ. Blank					07/13/16	1100		11										3	3	2	1	1	1		003
5	Trip Blank					07/13/16	0830		2										2							004
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Clint Sorrell / PACE	07/13/16	0756	Charles Forbes / Pace	7/14	0756				
	Charles Forbes / Pace	7/14	1611	Jmorio / Pace HVL	7-14	1610	2.1	4	N	4

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Clint Sorrell

SIGNATURE of SAMPLER: Clint Sorrell

DATE Signed (MM/DD/YY): 07/13/16

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

C

Appendix C – 7th & 8th Round Electronic Data Deliverables

D

Appendix D – Background & Interwell Statistical Analysis

Prediction Limits for Background Well Parameters
Charah Inc. Moncure Mine Rd Structural Fill

Prediction Limits (PL) and proposed site standards for Parameters measured in background well BG-1 for the Moncure Mine Rd Structural Fill site were developed in accordance with Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance (USEPA, March 2009). The general procedures used are outlined in Flowchart 1 and its accompanying description. Calculations were performed using the Chemstat software package, Version 6.3.0.2. Parameters for which background concentrations were calculated are: antimony, arsenic, barium, beryllium, boron, cadmium, calcium, chloride, chromium, cobalt, copper, fluoride, lead, lithium, mercury, molybdenum, nickel, pH, radium-226, radium-228, selenium, silver, sulfate, thallium, total dissolved solids (TDS), vanadium, and zinc. These Parameters were measured during 8 sampling events from August 2015 to July 2016.

1.0 Summary of Procedures Used

Methods for the background groundwater statistics are selected from the approved methods in accordance with Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance (USEPA, March 2009) to fit the need for the facility. The methods and sequence of statistics selected based on the interpretation of the Unified Guide are outlined in Flowchart 1.

During the initial steps of this process, the background well data were tested for outliers, adjusted for non-detects data, evaluated for data distribution and trend. Parametric or non-parametric prediction methods were selected based on the results of the initial steps of the statistical procedures.

1.1 Test for Outliers – Dixon's test (valid for sample sizes < 25) is used to detect outliers for each of the Parameters measured during the 8 sampling events. Any values identified as outliers are noted in a statistical summary table. However, outliers are not removed from subsequent analyses unless the quality assurance review for those questionable analytical results determined that those values were from impacted field results or as a result of laboratory error or contamination. Outlier tests are not performed for Parameters that do not have any measured values greater than its MRL.

1.2 Adjustment of Non-Detects (NDs) - NDs (commonly described as "non-detects") represent analytical results reported as below their Method Reporting Limits (bMRL) and are adjusted based on the percentage of bMRL values. When less than 15 percent of values for a Parameter are NDs, those values are replaced with a value equal to ½ of the MRL. When 15 percent to 50 percent of values are reported below the MRL, the Aitcheson Adjustment is used for the ND data. The values for the NDs are set equal to

their respective MRLs when more than 50 percent of values for a Parameter are below its MRL, and a non-parametric method is used.

1.3 **Distribution Assessment** - Data are evaluated to determine whether the distribution of each Parameter satisfies normality assumptions for further statistical analysis when less than 50 percent of the data for the Parameter are bMRL (<50% ND). Normality is evaluated using the Shapiro-Wilks test, which applies to cases where there are fewer than 50 samples. Distributions are first evaluated using non-transformed data and then, if the distribution does not satisfy normality constraints, it is tested again using natural log (ln) transformed data.

1.4 **Trend Assessment** - The background well concentration data are evaluated to determine if seasonal trends exist if there are any detected results. Trends are evaluated using the Mann-Kendall test (a non-parametric test for trend).

1.5 **Prediction Limits** – Data are evaluated to determine whether a Parametric Prediction Limit (PPL) or a Non-parametric Prediction Limit (NPPL) can be used to estimate prediction limits for each Parameter at the background well. This evaluation depends on the percentage of measurements below their MRL and whether a distribution satisfies normality assumptions. For Parameters with less than 50 percent of measurements reported as below their MRL and a distribution that satisfies normality assumptions, a PPL is calculated. For Parameters with more than 50 percent of measurements reported as below their MRL or having a distribution that does not satisfy normality constraints, a NPPL is calculated.

1.5.1 **PPL Procedures** - For cases where data satisfy normality assumptions without transformation (Step 1.3), the parametric method is used to calculate the prediction limit (PL) using non-transformed data. For cases where non-transformed data do not satisfy normality assumptions but natural log-transformed data do, parametric methods are used to calculate the PLs based on transformed data. PPLs are calculated as detailed in the Unified Guidance using equation 18.3 (non transformed data) or equation 18.5 (natural log-transformed data) using values for the background well. Where natural log-transformed data are used, calculated prediction limits are re-expressed as arithmetic values (i.e., results were de-transformed from natural log values back into values on the original scale).

For Parameters other than pH, where compliance is determined only by an upper limit, a 1-sided (upper) 95 percent upper prediction limit calculation is performed. For pH, where compliance is determined by both upper and lower

limits, a 2-sided calculation is performed and is termed a parametric prediction interval (PPI).

1.5.2 NPPL Procedures - For cases where neither non-transformed nor natural log-transformed distributions satisfied normality assumptions (Step 1.3) and also for cases where more than 50 percent of measurements are below their MRL, a NPPL method – Chebyshev's Upper Prediction Limit Calculation was used to calculate the Upper Prediction Limit (UPL) for vanadium and zinc based on non-transformed data. Note that of the parameters which had more than half their samples as non-detects, only Vanadium and Zinc had a sufficient number of detected observations (i.e. at least 2 detects) from which to produce a NPPL. HDR used the MRL or the maximum detected result, which ever is higher as the upper limit for the following parameters: Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, and Silver.

1.6 Comparison of Background Well PLs to Groundwater Standards

The background well calculated PLs are tabulated and compared to 2L Standards or EPA Maximum Concentration Limit (MCL) in Table 1.

2.0 Statistical Results and Summary

PL calculations and proposed site standards for the Moncure Mine Rd site are presented in Table 1 and summarized as follows:

- The following Parameters had more than 50 percent of measurements reported as being below their MRL: antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc. For these parameters, the background well PL was calculated using Non-Parametric Prediction Limit (equal to maximum MRL or Maximum background concentration, which ever is larger); but for vanadium and zinc, the Chebyshev Inequality UPL Method was used (Table 1).

- The following Parameters had less than 50 percent of measurements reported as being below their MRL, with distributions that satisfy normality assumptions: barium, boron, calcium, chloride, lithium, radium-226, radium-228, sulfate, and TDS. For these Parameters, the background well upper PL was calculated using equation 18.3 of the Unified Guidance (95% Upper Prediction Limit).

- Fluoride had less than 50 percent of measurements reported as being below its MRL, with distributions that met normality assumptions when measurements were natural log-transformed. The parametric prediction limit was calculated using equation 18.5 of the Unified Guidance (95% Upper Prediction Limit).

- The PL for field measured pH was calculated as a 95% (2 sided) parametric prediction interval.

- The calculated PL for antinomy, arsenic, cobalt, thallium, TDS, and vanadium from the background well were higher than their respective 2L, MCL, or groundwater protection limits. However, the PL for antinomy, arsenic, cobalt equal to the MRLs for these parameters and there was only one detections from 8 monitoring events at levels below their respective MRLs.

3.0 Literature Cited

USEPA, 2009. Unified Guidance - Statistical analysis of groundwater monitoring data at RCRA facilities. Office of Resource Conservation and Recovery Program Implementation and Information Division, U.S. Environmental Protection Agency. EPA 530-R-09-007.

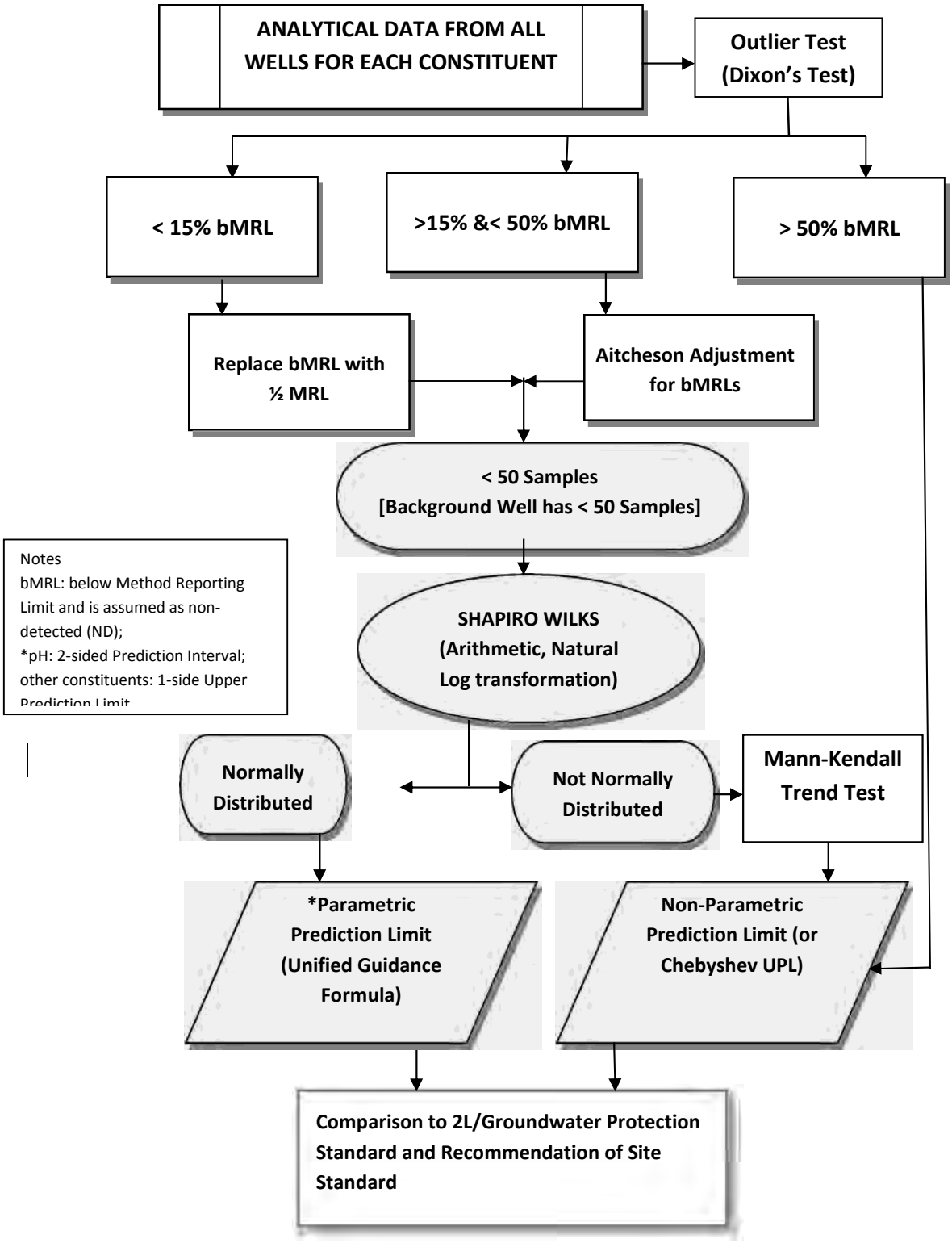
DRAFT

Table 1
Summary for Chemstat Prediction Limit for Background Groundwater Parameters
Charah Inc. Monocure Mine RD Structured Fill Site
Monitoring Periods: August 2015 to July 2016

Parameter	Samples Size	Sampling Events Below MRL	Dixon's Outlier Monitoring Period	$^{\alpha}$Non-Detect Adjustment	Shapiro-Wilks Test	Data Transformation	Mann-Kendall Trend (Background Well)	95% Upper Parametric Prediction Limit				Non-Parametric Prediction Limit	2L Standard or MCL	Units
								Mean	Std Dev.	t Value	Y			
Antimony	8	7	No	No		No	No					5	1**	µg/L
Arsenic	8	7	No	No		No	No					10	10	µg/L
Barium	8	0	No	No	Normal	No	No	353.25	44.7	3.374	513.2		700	µg/L
Beryllium	8	7	No	No		No	No					1	4**	µg/L
Boron	8	0	No	No	Normal	No	No	6.575	1.01	3.374	10.2		700	µg/L
Cadmium	8	7	No	No		No	No					1	2	µg/L
Calcium	8	0	10/15/2015	No	Normal	No	No	31050	3330	3.374	42967		NE	µg/L
Chloride	8	0	No	No	Normal	No	No	279	18.5	3.374	345.2		250	mg/L
Chromium	8	8	No	No		No	No					5	10	µg/L
Cobalt	8	7	No	No		No	No					5	1**	µg/L
Copper	8	7	No	No		No	No					5	1000	µg/L
$^{\sigma}$Fluoride	8	0	8/12/2015	No	Normal	Natural Log	No	-2.048	0.235	3.374	0.3		2	mg/L
Lead	8	7	No	No		No	No					5	15	µg/L
Lithium	8	0	4/5/2016	No	Normal	No	No	20.46	8.459	3.566	52.5		NE	µg/L
Mercury	8	7	No	No		No	No					0.2	1	µg/L
Molybdenum	8	6	8/12/15, 2/16/16	No		No	No					6.8	NE	µg/L
Nickel	8	7	No	No		No	No					5	100	µg/L
pH(Field)	8	0	No	No	Normal	No	No	6.499	0.163	4.102	5.79 - 7.21*		NE	S.U.
Radium-226	8	1	No	ND=1/2DL	Normal	No	No	0.57	0.226	3.374	1.38		5 (Ra226&Ra228)	pCi/L
Radium-228	8	1	No	ND=1/2DL	Normal	No	No	0.572	0.422	3.374	2.08			pCi/L
Selenium	8	7	No	No		No	No					10	20	µg/L
Silver	8	7	No	No		No	No					5	20	µg/L
Sulfate	8	0	8/12/15, 10/15/15	No	Normal	No	No	18.8	2.23	3.374	26.8		250	mg/L
Thallium	8	7	2/16/2016	No		No	No					13.7	0.28**	µg/L
TDS	8	0	No	No	Normal	No	No	652.3	19.7	3.374	723		500	mg/L
Vanadium	8	5	8/12/2015	No		No	No					6.65$^{\varepsilon}$	0.3**	µg/L
Zinc	8	6	No	No		No	No					11.11$^{\varepsilon}$	1000	µg/L

Note: MRL -Method Reporting Limit;
α Non-Detected = <Method Reporting Limit;
σThe mean, Std. Dev., and t value for fluoride are in natural log scale;
*pH is calculated as a 95% (2-sided) prediction interval using Equation 18.3 of the Unified Guidance;
** Groundwater Protection Standard (as shown in NCDENR Groundwater Constituent List, June 2011);
The UPL values for antimony, arsenic, and cobalt values for background wells are greater than their respective 2L Standard, MCL, or Groundwater Protection Standard;
but the UPL for antimony, arsenic, and cobalt is equal to their respective MRL; and they were detected only once below their respective MRL values.
The UPL values for thallium, TDS, and vanadium for background wells are greater than their respective 2L Standard, MCL, or Groundwater Protection Standard;
but the historic detections for these parameters does not show any increasing trend by Sen's Slope test.
Grey shaded cells = Not applicable and were not tested;

FLOW CHART 1
PREDICTION INTERVAL/LIMIT CALCULATION METHODS FOR BACKGROUND WELLS



Concentrations (ug/L)

Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.55 J	0.55 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Antimony

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.55 J	FALSE
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	ND<5 U	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Antimony
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	0.55 J	4.45	1	0
ND<5 U	0.55 J	4.45	2	0
ND<5 U	0.55 J	4.45	3	0
ND<5 U	0.55 J	4.45	4	0
ND<5 U	0.55 J	4.45	5	0
ND<5 U	0.55 J	4.45	6	0
ND<5 U	0.55 J	4.45	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 51.3889%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	**7/12/2016**	**1**	**6.1**	**TRUE**
MW-2	**7/12/2016**	**1**	**12.3**	**TRUE**
MW-3	**7/11/2016**	**1**	**11.4**	**TRUE**
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	**7/12/2016**	**1**	**7.2**	**TRUE**

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Concentrations (ug/L)

Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	2.2	2.2
			10/15/2015	ND<10 U	ND<10 U
			11/18/2015	ND<10 U	ND<10 U
			1/4/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/5/2016	ND<10 U	ND<10 U
			5/26/2016	ND<10 U	ND<10 U
			7/12/2016	ND<10 U	ND<10 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Arsenic

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	2.2	FALSE
	10/15/2015	ND<10 U	FALSE
	11/18/2015	ND<10 U	FALSE
	1/4/2016	ND<10 U	FALSE
	2/16/2016	ND<10 U	FALSE
	4/5/2016	ND<10 U	FALSE
	5/26/2016	ND<10 U	FALSE
	7/12/2016	ND<10 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Arsenic
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10 U	2.2	7.8	1	0
ND<10 U	2.2	7.8	2	0
ND<10 U	2.2	7.8	3	0
ND<10 U	2.2	7.8	4	0
ND<10 U	2.2	7.8	5	0
ND<10 U	2.2	7.8	6	0
ND<10 U	2.2	7.8	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 87.5%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 10
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	10	FALSE
MW-2	7/12/2016	1	10	FALSE
MW-3	7/11/2016	1	10	FALSE
MW-4	7/13/2016	1	10	FALSE
MW-5	7/11/2016	1	10	FALSE
MW-6	7/11/2016	1	10	FALSE
MW-7	7/11/2016	1	10	FALSE
MW-8	7/12/2016	1	10	FALSE

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Concentrations (ug/L)

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	380	380
			10/15/2015	443	443
			11/18/2015	344	344
			1/4/2016	310	310
			2/16/2016	354	354
			4/5/2016	302	302
			5/26/2016	330	330
			7/12/2016	363	363

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Barium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.473684	0.102564	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	380	FALSE
	10/15/2015	443	FALSE
	11/18/2015	344	FALSE
	1/4/2016	310	FALSE
	2/16/2016	354	FALSE
	4/5/2016	302	FALSE
	5/26/2016	330	FALSE
	7/12/2016	363	FALSE

Shapiro-Wilks Test of Normality

Parameter: Barium

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	302	443	141	0.6052	85.3332
2	310	380	70	0.3164	22.148
3	330	363	33	0.1743	5.7519
4	344	354	10	0.0561	0.561
5	354	344	-10		
6	363	330	-33		
7	380	310	-70		
8	443	302	-141		

Sum of b values = 113.794

Sample Standard Deviation = 44.7046

W Statistic = 0.92563

5% Critical value of 0.818 is less than 0.92563

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.92563

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 353.25
Background Std Dev = 44.7046

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	225	[0, 513.237]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	220	[0, 513.237]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**728**	**[0, 513.237]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	257	[0, 513.237]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	93	[0, 513.237]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	89.8	[0, 513.237]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	224	[0, 513.237]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**1200**	**[0, 513.237]**	**TRUE**

Concentrations (ug/L)

Parameter: Beryllium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.14 J	0.14 J
			10/15/2015	ND<1 U	ND<1 U
			11/18/2015	ND<1 U	ND<1 U
			1/4/2016	ND<1 U	ND<1 U
			2/16/2016	ND<1 U	ND<1 U
			4/5/2016	ND<1 U	ND<1 U
			5/26/2016	ND<1 U	ND<1 U
			7/12/2016	ND<1 U	ND<1 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Beryllium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.14 J	FALSE
	10/15/2015	ND<1 U	FALSE
	11/18/2015	ND<1 U	FALSE
	1/4/2016	ND<1 U	FALSE
	2/16/2016	ND<1 U	FALSE
	4/5/2016	ND<1 U	FALSE
	5/26/2016	ND<1 U	FALSE
	7/12/2016	ND<1 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Beryllium
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<1 U	0.14 J	0.86	1	0
ND<1 U	0.14 J	0.86	2	0
ND<1 U	0.14 J	0.86	3	0
ND<1 U	0.14 J	0.86	4	0
ND<1 U	0.14 J	0.86	5	0
ND<1 U	0.14 J	0.86	6	0
ND<1 U	0.14 J	0.86	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Beryllium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 95.8333%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 1
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	1	FALSE
MW-2	7/12/2016	1	1	FALSE
MW-3	7/11/2016	1	1	FALSE
MW-4	7/13/2016	1	1	FALSE
MW-5	7/11/2016	1	1	FALSE
MW-6	7/11/2016	1	1	FALSE
MW-7	7/11/2016	1	1	FALSE
MW-8	7/12/2016	1	1	FALSE

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Concentrations (ug/L)

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	8.5 J	8.5 J
			10/15/2015	6.1	6.1
			11/18/2015	5.9	5.9
			1/4/2016	7.5	7.5
			2/16/2016	5.5	5.5
			4/5/2016	6	6
			5/26/2016	6.1	6.1
			7/12/2016	7	7

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Boron

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.384615	0.2	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	8.5 J	FALSE
	10/15/2015	6.1	FALSE
	11/18/2015	5.9	FALSE
	1/4/2016	7.5	FALSE
	2/16/2016	5.5	FALSE
	4/5/2016	6	FALSE
	5/26/2016	6.1	FALSE
	7/12/2016	7	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5.5	8.5	3	0.6052	1.8156
2	5.9	7.5	1.6	0.3164	0.50624
3	6	7	1	0.1743	0.1743
4	6.1	6.1	0	0.0561	0
5	6.1	6.1	0		
6	7	6	-1		
7	7.5	5.9	-1.6		
8	8.5	5.5	-3		

Sum of b values = 2.49614

Sample Standard Deviation = 1.0096

W Statistic = 0.873261

5% Critical value of 0.818 is less than 0.873261

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.873261

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 6.575
Background Std Dev = 1.0096

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	7.9	[0, 10.1881]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**39.4**	**[0, 10.1881]**	**TRUE**

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**41.9**	**[0, 10.1881]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	5	[0, 10.1881]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	9.8	[0, 10.1881]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	7.7	[0, 10.1881]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**22.7**	**[0, 10.1881]**	**TRUE**

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	9.6	[0, 10.1881]	FALSE

Concentrations (ug/L)

Parameter: Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.061 J	0.061 J
			10/15/2015	ND<1 U	ND<1 U
			11/18/2015	ND<1 U	ND<1 U
			1/4/2016	ND<1 U	ND<1 U
			2/16/2016	ND<1 U	ND<1 U
			4/5/2016	ND<1 U	ND<1 U
			5/26/2016	ND<1 U	ND<1 U
			7/12/2016	ND<1 U	ND<1 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Cadmium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.061 J	FALSE
	10/15/2015	ND<1 U	FALSE
	11/18/2015	ND<1 U	FALSE
	1/4/2016	ND<1 U	FALSE
	2/16/2016	ND<1 U	FALSE
	4/5/2016	ND<1 U	FALSE
	5/26/2016	ND<1 U	FALSE
	7/12/2016	ND<1 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Cadmium
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<1 U	0.061 J	0.939	1	0
ND<1 U	0.061 J	0.939	2	0
ND<1 U	0.061 J	0.939	3	0
ND<1 U	0.061 J	0.939	4	0
ND<1 U	0.061 J	0.939	5	0
ND<1 U	0.061 J	0.939	6	0
ND<1 U	0.061 J	0.939	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0
ND<1 U	ND<1 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 90.2778%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 1
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	1	FALSE
MW-2	7/12/2016	1	1	FALSE
MW-3	7/11/2016	1	1	FALSE
MW-4	7/13/2016	1	1	FALSE
MW-5	7/11/2016	1	1	FALSE
MW-6	7/11/2016	1	1	FALSE
MW-7	7/11/2016	1	1	FALSE
MW-8	7/12/2016	1	1	FALSE

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Concentrations (ug/L)

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	32000 B	32000 B
			10/15/2015	38200	38200
			11/18/2015	31700	31700
			1/4/2016	28600	28600
			2/16/2016	29500	29500
			4/5/2016	27300	27300
			5/26/2016	29500	29500
			7/12/2016	31600	31600

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Calcium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.645833	0.276596	0.554	38200
2	0.0638298	0.276596	0.507	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	32000 B	FALSE
	10/15/2015	**38200**	**TRUE**
	11/18/2015	31700	FALSE
	1/4/2016	28600	FALSE
	2/16/2016	29500	FALSE
	4/5/2016	27300	FALSE
	5/26/2016	29500	FALSE
	7/12/2016	31600	FALSE

Shapiro-Wilks Test of Normality

Parameter: Calcium

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	27300	38200	10900	0.6052	6596.68
2	28600	32000	3400	0.3164	1075.76
3	29500	31700	2200	0.1743	383.46
4	29500	31600	2100	0.0561	117.81
5	31600	29500	-2100		
6	31700	29500	-2200		
7	32000	28600	-3400		
8	38200	27300	-10900		

Sum of b values = 8173.71
Sample Standard Deviation = 3329.95
W Statistic = 0.860726

5% Critical value of 0.818 is less than 0.860726
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.860726
Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 31050
Background Std Dev = 3329.95

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	127000	[0, 42967.1]	TRUE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	159000	[0, 42967.1]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	182000	[0, 42967.1]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	53500	[0, 42967.1]	TRUE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	9990	[0, 42967.1]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	35400	[0, 42967.1]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	53200	[0, 42967.1]	TRUE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	125000	[0, 42967.1]	TRUE

Concentrations (mg/L)

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	270	270
			10/15/2015	311	311
			11/18/2015	283	283
			1/4/2016	285	285
			2/16/2016	277	277
			4/5/2016	264	264
			5/26/2016	250	250
			7/12/2016	292	292

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Chloride
All Locations

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.404255	0.333333	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	270	FALSE
	10/15/2015	311	FALSE
	11/18/2015	283	FALSE
	1/4/2016	285	FALSE
	2/16/2016	277	FALSE
	4/5/2016	264	FALSE
	5/26/2016	250	FALSE
	7/12/2016	292	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chloride

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	250	311	61	0.6052	36.9172
2	264	292	28	0.3164	8.8592
3	270	285	15	0.1743	2.6145
4	277	283	6	0.0561	0.3366
5	283	277	-6		
6	285	270	-15		
7	292	264	-28		
8	311	250	-61		

Sum of b values = 48.7275

Sample Standard Deviation = 18.501

W Statistic = 0.990972

5% Critical value of 0.818 is less than 0.990972

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.990972

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 279
Background Std Dev = 18.501

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	547	[0, 345.211]	TRUE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	1160	[0, 345.211]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	1190	[0, 345.211]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	423	[0, 345.211]	TRUE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	17.6	[0, 345.211]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	239	[0, 345.211]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	382	[0, 345.211]	TRUE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	504	[0, 345.211]	TRUE

Concentrations (ug/L)

Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 8
Percent Non-Detects: 100%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	8 (100%)	8/12/2015	ND<5 U	ND<5 U
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Mann-Kendall Trend Analysis

Parameter: Chromium
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0
ND<5 U	ND<5 U	0	0	0

S Statistic = 0 - 0 = 0
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |0| is 1.096
1.096 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 73.9726%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	**7/12/2016**	**1**	**5.2**	**TRUE**
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (ug/L)

Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.91 J	0.91 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Cobalt

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.91 J	FALSE
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	ND<5 U	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Cobalt
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	0.91 J	4.09	1	0
ND<5 U	0.91 J	4.09	2	0
ND<5 U	0.91 J	4.09	3	0
ND<5 U	0.91 J	4.09	4	0
ND<5 U	0.91 J	4.09	5	0
ND<5 U	0.91 J	4.09	6	0
ND<5 U	0.91 J	4.09	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 86.1111%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	7/12/2016	1	5	FALSE
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (ug/L)

Parameter: Copper

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	1.4 B	1.4 B
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Copper
All Locations

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	1.4 B	FALSE
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	ND<5 U	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Copper
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	1.4 B	3.6	1	0
ND<5 U	1.4 B	3.6	2	0
ND<5 U	1.4 B	3.6	3	0
ND<5 U	1.4 B	3.6	4	0
ND<5 U	1.4 B	3.6	5	0
ND<5 U	1.4 B	3.6	6	0
ND<5 U	1.4 B	3.6	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Copper

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 86.1111%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	7/12/2016	1	5	FALSE
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (mg/L)

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	0.22 J	0.22 J
			10/15/2015	0.1	0.1
			11/18/2015	0.12	0.12
			1/4/2016	0.13	0.13
			2/16/2016	0.13	0.13
			4/5/2016	0.13	0.13
			5/26/2016	0.12	0.12
			7/12/2016	0.11	0.11

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Fluoride

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.818182	0.333333	0.554	0.22
2	0	0.333333	0.507	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	**0.22 J**	**TRUE**
	10/15/2015	0.1	FALSE
	11/18/2015	0.12	FALSE
	1/4/2016	0.13	FALSE
	2/16/2016	0.13	FALSE
	4/5/2016	0.13	FALSE
	5/26/2016	0.12	FALSE
	7/12/2016	0.11	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	-2.30259	-1.51413	0.788457	0.6052	0.477174
2	-2.20727	-2.04022	0.167054	0.3164	0.0528559
3	-2.12026	-2.04022	0.0800427	0.1743	0.0139514
4	-2.12026	-2.04022	0.0800427	0.0561	0.0044904
5	-2.04022	-2.12026	-0.0800427		
6	-2.04022	-2.12026	-0.0800427		
7	-2.04022	-2.20727	-0.167054		
8	-1.51413	-2.30259	-0.788457		

Sum of b values = 0.548472

Sample Standard Deviation = 0.234773

W Statistic = 0.77968

5% Critical value of 0.818 exceeds 0.77968

Evidence of non-normality at 95% level of significance

1% Critical value of 0.749 is less than 0.77968

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Fluoride

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = -2.04815
Background Std Dev = 0.234773

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	-2.12026	[0, -1.20795]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	-1.96611	[0, -1.20795]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	-1.34707	[0, -1.20795]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	**1**	**-1.07881**	**[0, -1.20795]**	**TRUE**

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**-0.693147**	**[0, -1.20795]**	**TRUE**

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**-1.17118**	**[0, -1.20795]**	**TRUE**

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	-1.56065	[0, -1.20795]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	-2.30259	[0, -1.20795]	FALSE

Concentrations (ug/L)

Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	1.4	1.4
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Lead

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	1.4	FALSE
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	ND<5 U	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Lead
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	1.4	3.6	1	0
ND<5 U	1.4	3.6	2	0
ND<5 U	1.4	3.6	3	0
ND<5 U	1.4	3.6	4	0
ND<5 U	1.4	3.6	5	0
ND<5 U	1.4	3.6	6	0
ND<5 U	1.4	3.6	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 86.1111%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	7/12/2016	1	5	FALSE
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (ug/L)

Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 7
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 7
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	7	0 (0%)	10/15/2015	14.9	14.9
			11/18/2015	12.1	12.1
			1/4/2016	15	15
			2/16/2016	17.1	17.1
			4/5/2016	36.8	36.8
			5/26/2016	23.5	23.5
			7/12/2016	23.8	23.8

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Lithium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 7 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.526316	0.11336	0.507	36.8
2	0.025641	0.239316	0.56	None

Loc.	Date	Conc.	Outlier
BG-1	10/15/2015	14.9	FALSE
	11/18/2015	12.1	FALSE
	1/4/2016	15	FALSE
	2/16/2016	17.1	FALSE
	4/5/2016	**36.8**	**TRUE**
	5/26/2016	23.5	FALSE
	7/12/2016	23.8	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12.1	36.8	24.7	0.6233	15.3955
2	14.9	23.8	8.9	0.3031	2.69759
3	15	23.5	8.5	0.1401	1.19085
4	17.1	17.1	0		
5	23.5	15	-8.5		
6	23.8	14.9	-8.9		
7	36.8	12.1	-24.7		

Sum of b values = 19.2839

Sample Standard Deviation = 8.4587

W Statistic = 0.866232

5% Critical value of 0.803 is less than 0.866232

Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less than 0.866232

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Lithium

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 7
Background Mean = 20.4571
Background Std Dev = 8.4587

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 7 (background observations) - 1
t(0.99375, 7) = 3.56624

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	32.8	[0, 52.7057]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**356**	**[0, 52.7057]**	**TRUE**

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**73.2**	**[0, 52.7057]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	0.5	[0, 52.7057]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	9.3	[0, 52.7057]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	31.7	[0, 52.7057]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	23	[0, 52.7057]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	31.2	[0, 52.7057]	FALSE

Concentrations (ug/L)

Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.075 J	0.075 J
			10/15/2015	ND<0.2 U	ND<0.2 U
			11/18/2015	ND<0.2 U	ND<0.2 U
			1/4/2016	ND<0.2 U	ND<0.2 U
			2/16/2016	ND<0.2 U	ND<0.2 U
			4/5/2016	ND<0.2 U	ND<0.2 U
			5/26/2016	ND<0.2 U	ND<0.2 U
			7/12/2016	ND<0.2 U	ND<0.2 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Mercury

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.075 J	FALSE
	10/15/2015	ND<0.2 U	FALSE
	11/18/2015	ND<0.2 U	FALSE
	1/4/2016	ND<0.2 U	FALSE
	2/16/2016	ND<0.2 U	FALSE
	4/5/2016	ND<0.2 U	FALSE
	5/26/2016	ND<0.2 U	FALSE
	7/12/2016	ND<0.2 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Mercury
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<0.2 U	0.075 J	0.125	1	0
ND<0.2 U	0.075 J	0.125	2	0
ND<0.2 U	0.075 J	0.125	3	0
ND<0.2 U	0.075 J	0.125	4	0
ND<0.2 U	0.075 J	0.125	5	0
ND<0.2 U	0.075 J	0.125	6	0
ND<0.2 U	0.075 J	0.125	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0
ND<0.2 U	ND<0.2 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 98.6111%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 0.2
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	0.2	FALSE
MW-2	7/12/2016	1	0.2	FALSE
MW-3	7/11/2016	1	0.2	FALSE
MW-4	7/13/2016	1	0.2	FALSE
MW-5	7/11/2016	1	0.2	FALSE
MW-6	7/11/2016	1	0.2	FALSE
MW-7	7/11/2016	1	0.2	FALSE
MW-8	7/12/2016	1	0.2	FALSE

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Concentrations (ug/L)

Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 6
Percent Non-Detects: 75%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	6 (75%)	8/12/2015	0.55 J	0.55 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	6.8	6.8
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Molybdenum

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	1	1	0.554	6.8
2	0	1	0.507	0.55

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	**0.55 J**	**TRUE**
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	**6.8**	**TRUE**
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Molybdenum
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	0.55 J	4.45	1	0
ND<5 U	0.55 J	4.45	2	0
ND<5 U	0.55 J	4.45	3	0
6.8	0.55 J	6.25	4	0
ND<5 U	0.55 J	4.45	5	0
ND<5 U	0.55 J	4.45	6	0
ND<5 U	0.55 J	4.45	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
6.8	ND<5 U	1.8	8	0
ND<5 U	ND<5 U	0	8	0
ND<5 U	ND<5 U	0	8	0
ND<5 U	ND<5 U	0	8	0
ND<5 U	ND<5 U	0	8	0
6.8	ND<5 U	1.8	9	0
ND<5 U	ND<5 U	0	9	0
ND<5 U	ND<5 U	0	9	0
ND<5 U	ND<5 U	0	9	0
6.8	ND<5 U	1.8	10	0
ND<5 U	ND<5 U	0	10	0
ND<5 U	ND<5 U	0	10	0
ND<5 U	ND<5 U	0	10	0
ND<5 U	6.8	-1.8	10	1
ND<5 U	6.8	-1.8	10	2
ND<5 U	6.8	-1.8	10	3
ND<5 U	ND<5 U	0	10	3
ND<5 U	ND<5 U	0	10	3
ND<5 U	ND<5 U	0	10	3

S Statistic = 10 - 3 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 63.8889%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 6.8
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	**7/12/2016**	**1**	**10.8**	**TRUE**
MW-3	**7/11/2016**	**1**	**12**	**TRUE**
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (ug/L)

Parameter: Nickel

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	1.3 J	1.3 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Nickel

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	1.3 J	FALSE
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	ND<5 U	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: pH(Field)
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6.24	6.44	-0.2	0	1
6.38	6.44	-0.06	0	2
6.51	6.44	0.07	1	2
6.52	6.44	0.08	2	2
6.6	6.44	0.16	3	2
6.8	6.44	0.36	4	2
6.5	6.44	0.06	5	2
6.38	6.24	0.14	6	2
6.51	6.24	0.27	7	2
6.52	6.24	0.28	8	2
6.6	6.24	0.36	9	2
6.8	6.24	0.56	10	2
6.5	6.24	0.26	11	2
6.51	6.38	0.13	12	2
6.52	6.38	0.14	13	2
6.6	6.38	0.22	14	2
6.8	6.38	0.42	15	2
6.5	6.38	0.12	16	2
6.52	6.51	0.01	17	2
6.6	6.51	0.09	18	2
6.8	6.51	0.29	19	2
6.5	6.51	-0.01	19	3
6.6	6.52	0.08	20	3
6.8	6.52	0.28	21	3
6.5	6.52	-0.02	21	4
6.8	6.6	0.2	22	4
6.5	6.6	-0.1	22	5
6.5	6.8	-0.3	22	6

S Statistic = 22 - 6 = 16
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |16| is 0.062
0.062 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Nickel

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 76.3889%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	7/12/2016	1	5	FALSE
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (S.U.)

Parameter: pH(Field)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	6.44	6.44
			10/15/2015	6.24	6.24
			11/18/2015	6.38	6.38
			1/4/2016	6.51	6.51
			2/16/2016	6.52	6.52
			4/5/2016	6.6	6.6
			5/26/2016	6.8	6.8
			7/12/2016	6.5	6.5

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: pH(Field)

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.47619	0.388889	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	6.44	FALSE
	10/15/2015	6.24	FALSE
	11/18/2015	6.38	FALSE
	1/4/2016	6.51	FALSE
	2/16/2016	6.52	FALSE
	4/5/2016	6.6	FALSE
	5/26/2016	6.8	FALSE
	7/12/2016	6.5	FALSE

Shapiro-Wilks Test of Normality

Parameter: pH(Field)

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.24	6.8	0.56	0.6052	0.338912
2	6.38	6.6	0.22	0.3164	0.069608
3	6.44	6.52	0.08	0.1743	0.013944
4	6.5	6.51	0.01	0.0561	0.000561
5	6.51	6.5	-0.01		
6	6.52	6.44	-0.08		
7	6.6	6.38	-0.22		
8	6.8	6.24	-0.56		

Sum of b values = 0.423025
Sample Standard Deviation = 0.163046
W Statistic = 0.961645

5% Critical value of 0.818 is less than 0.961645
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.961645
Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: pH(Field)

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Inter-Well Unified Guid. Formula 95% Two-Sided Comparison

Background Samples = 8
Background Mean = 6.49875
Background Std Dev = 0.163046

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8)/2 = 99.6875 %
t is Percentile of Student's T-Test (0.95/8/2) = 0.996875
Degrees of Freedom = 8 (background observations) - 1
t(0.996875, 8) = 4.10219

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	6.5	[5.79, 7.21]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**8.5**	**[5.79, 7.21]**	**TRUE**

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**7.3**	**[5.79, 7.21]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.3	[5.79, 7.21]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.8	[5.79, 7.21]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.4	[5.79, 7.21]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.8	[5.79, 7.21]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	6.9	[5.79, 7.21]	FALSE

Concentrations (pCi/L)

Parameter: Radium-226

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 1
Percent Non-Detects: 12.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	1 (12.5%)	8/12/2015	0.802	0.802
			10/15/2015	0.362	0.362
			11/18/2015	0.8	0.8
			1/4/2016	ND<0.206	ND<0.206
			2/16/2016	0.553	0.553
			4/5/2016	0.407	0.407
			5/26/2016	0.654	0.654
			7/12/2016	0.777	0.777

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Radium-226

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.00454545	0.262626	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.802	FALSE
	10/15/2015	0.362	FALSE
	11/18/2015	0.8	FALSE
	1/4/2016	ND<0.206	FALSE
	2/16/2016	0.553	FALSE
	4/5/2016	0.407	FALSE
	5/26/2016	0.654	FALSE
	7/12/2016	0.777	FALSE

Shapiro-Wilks Test of Normality

Parameter: Radium-226

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.103	0.802	0.699	0.6052	0.423035
2	0.362	0.8	0.438	0.3164	0.138583
3	0.407	0.777	0.37	0.1743	0.064491
4	0.553	0.654	0.101	0.0561	0.0056661
5	0.654	0.553	-0.101		
6	0.777	0.407	-0.37		
7	0.8	0.362	-0.438		
8	0.802	0.103	-0.699		

Sum of b values = 0.631775

Sample Standard Deviation = 0.25172

W Statistic = 0.899897

5% Critical value of 0.818 is less than 0.899897

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.899897

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Radium-226

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 0.570125
Background Std Dev = 0.226541

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.448	[0, 1.38086]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.58	[0, 1.38086]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.308	[0, 1.38086]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.185	[0, 1.38086]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.092	[0, 1.38086]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.393	[0, 1.38086]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0	[0, 1.38086]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.616	[0, 1.38086]	FALSE

Concentrations (pCi/L)

Parameter: Radium-228

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 1
Percent Non-Detects: 12.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	1 (12.5%)	8/12/2015	ND<0.496 U	ND<0.496 U
			10/15/2015	0.723	0.723
			11/18/2015	1.29	1.29
			1/4/2016	0.808	0.808
			2/16/2016	0.256	0.256
			4/5/2016	0.828	0.828
			5/26/2016	0.0108	0.0108
			7/12/2016	0.163	0.163

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Radium-228

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.409938	0.186246	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	ND<0.496 U	FALSE
	10/15/2015	0.723	FALSE
	11/18/2015	1.29	FALSE
	1/4/2016	0.808	FALSE
	2/16/2016	0.256	FALSE
	4/5/2016	0.828	FALSE
	5/26/2016	0.0108	FALSE
	7/12/2016	0.163	FALSE

Shapiro-Wilks Test of Normality

Parameter: Radium-228

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.0108	1.29	1.2792	0.6052	0.774172
2	0.163	0.828	0.665	0.3164	0.210406
3	0.248	0.808	0.56	0.1743	0.097608
4	0.256	0.723	0.467	0.0561	0.0261987
5	0.723	0.256	-0.467		
6	0.808	0.248	-0.56		
7	0.828	0.163	-0.665		
8	1.29	0.0108	-1.2792		

Sum of b values = 1.10838

Sample Standard Deviation = 0.437338

W Statistic = 0.917589

5% Critical value of 0.818 is less than 0.917589

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.917589

Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Radium-228

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 0.57185
Background Std Dev = 0.42214

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.833	[0, 2.08259]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.98	[0, 2.08259]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.801	[0, 2.08259]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.455	[0, 2.08259]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.568	[0, 2.08259]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.907	[0, 2.08259]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.019	[0, 2.08259]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.548	[0, 2.08259]	FALSE

Concentrations (ug/L)

Parameter: Selenium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	4.5	4.5
			10/15/2015	ND<10 U	ND<10 U
			11/18/2015	ND<10 U	ND<10 U
			1/4/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/5/2016	ND<10 U	ND<10 U
			5/26/2016	ND<10 U	ND<10 U
			7/12/2016	ND<10 U	ND<10 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Selenium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	4.5	FALSE
	10/15/2015	ND<10 U	FALSE
	11/18/2015	ND<10 U	FALSE
	1/4/2016	ND<10 U	FALSE
	2/16/2016	ND<10 U	FALSE
	4/5/2016	ND<10 U	FALSE
	5/26/2016	ND<10 U	FALSE
	7/12/2016	ND<10 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Selenium
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<10 U	4.5	5.5	1	0
ND<10 U	4.5	5.5	2	0
ND<10 U	4.5	5.5	3	0
ND<10 U	4.5	5.5	4	0
ND<10 U	4.5	5.5	5	0
ND<10 U	4.5	5.5	6	0
ND<10 U	4.5	5.5	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Selenium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 87.5%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 10
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	10	FALSE
MW-2	7/12/2016	1	10	FALSE
MW-3	7/11/2016	1	10	FALSE
MW-4	7/13/2016	1	10	FALSE
MW-5	7/11/2016	1	10	FALSE
MW-6	7/11/2016	1	10	FALSE
MW-7	7/11/2016	1	10	FALSE
MW-8	7/12/2016	1	10	FALSE

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Concentrations (ug/L)

Parameter: Silver

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.19 J	0.19 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Silver

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	0.19 J	FALSE
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	ND<5 U	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	ND<5 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Silver
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	0.19 J	4.81	1	0
ND<5 U	0.19 J	4.81	2	0
ND<5 U	0.19 J	4.81	3	0
ND<5 U	0.19 J	4.81	4	0
ND<5 U	0.19 J	4.81	5	0
ND<5 U	0.19 J	4.81	6	0
ND<5 U	0.19 J	4.81	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0
ND<5 U	ND<5 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Silver

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 93.0556%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	7/12/2016	1	5	FALSE
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

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Concentrations (mg/L)

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	23	23
			10/15/2015	15.1	15.1
			11/18/2015	17.5	17.5
			1/4/2016	19.5	19.5
			2/16/2016	18.6	18.6
			4/5/2016	19.6	19.6
			5/26/2016	19.3	19.3
			7/12/2016	18.2	18.2

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Sulfate

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.618182	0.533333	0.554	23
2	0.0222222	0.533333	0.507	15.1
3	0.047619	0.333333	0.56	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	**23**	**TRUE**
	10/15/2015	**15.1**	**TRUE**
	11/18/2015	17.5	FALSE
	1/4/2016	19.5	FALSE
	2/16/2016	18.6	FALSE
	4/5/2016	19.6	FALSE
	5/26/2016	19.3	FALSE
	7/12/2016	18.2	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate
All Locations
Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	15.1	23	7.9	0.6052	4.78108
2	17.5	19.6	2.1	0.3164	0.66444
3	18.2	19.5	1.3	0.1743	0.22659
4	18.6	19.3	0.7	0.0561	0.03927
5	19.3	18.6	-0.7		
6	19.5	18.2	-1.3		
7	19.6	17.5	-2.1		
8	23	15.1	-7.9		

Sum of b values = 5.71138
Sample Standard Deviation = 2.22903
W Statistic = 0.937891

5% Critical value of 0.818 is less than 0.937891
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.937891
Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 18.85
Background Std Dev = 2.22903

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	9.4	[0, 26.8272]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	205	[0, 26.8272]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	125	[0, 26.8272]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	9.2	[0, 26.8272]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	2.6	[0, 26.8272]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	53.8	[0, 26.8272]	TRUE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	11.2	[0, 26.8272]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	5.9	[0, 26.8272]	FALSE

Concentrations (ug/L)

Parameter: Thallium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 7
Percent Non-Detects: 87.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	ND<0.5 U	ND<0.5 U
			10/15/2015	ND<5.4 U	ND<5.4 U
			11/18/2015	ND<5.4 U	ND<5.4 U
			1/4/2016	ND<5.4 U	ND<5.4 U
			2/16/2016	13.7	13.7
			4/5/2016	ND<5.4 U	ND<5.4 U
			5/26/2016	ND<5.4 U	ND<5.4 U
			7/12/2016	ND<5.4 U	ND<5.4 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Thallium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	1	1	0.554	13.7
2	0	1	0.507	0.5

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	**ND<0.5 U**	**TRUE**
	10/15/2015	ND<5.4 U	FALSE
	11/18/2015	ND<5.4 U	FALSE
	1/4/2016	ND<5.4 U	FALSE
	2/16/2016	**13.7**	**TRUE**
	4/5/2016	ND<5.4 U	FALSE
	5/26/2016	ND<5.4 U	FALSE
	7/12/2016	ND<5.4 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Thallium
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5.4 U	ND<0.5 U	4.9	1	0
ND<5.4 U	ND<0.5 U	4.9	2	0
ND<5.4 U	ND<0.5 U	4.9	3	0
13.7	ND<0.5 U	13.2	4	0
ND<5.4 U	ND<0.5 U	4.9	5	0
ND<5.4 U	ND<0.5 U	4.9	6	0
ND<5.4 U	ND<0.5 U	4.9	7	0
ND<5.4 U	ND<5.4 U	0	7	0
ND<5.4 U	ND<5.4 U	0	7	0
13.7	ND<5.4 U	8.3	8	0
ND<5.4 U	ND<5.4 U	0	8	0
ND<5.4 U	ND<5.4 U	0	8	0
ND<5.4 U	ND<5.4 U	0	8	0
ND<5.4 U	ND<5.4 U	0	8	0
13.7	ND<5.4 U	8.3	9	0
ND<5.4 U	ND<5.4 U	0	9	0
ND<5.4 U	ND<5.4 U	0	9	0
ND<5.4 U	ND<5.4 U	0	9	0
13.7	ND<5.4 U	8.3	10	0
ND<5.4 U	ND<5.4 U	0	10	0
ND<5.4 U	ND<5.4 U	0	10	0
ND<5.4 U	ND<5.4 U	0	10	0
ND<5.4 U	13.7	-8.3	10	1
ND<5.4 U	13.7	-8.3	10	2
ND<5.4 U	13.7	-8.3	10	3
ND<5.4 U	ND<5.4 U	0	10	3
ND<5.4 U	ND<5.4 U	0	10	3
ND<5.4 U	ND<5.4 U	0	10	3

S Statistic = 10 - 3 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Thallium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 90.2778%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 13.7
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5.4	FALSE
MW-2	7/12/2016	1	5.4	FALSE
MW-3	7/11/2016	1	5.4	FALSE
MW-4	7/13/2016	1	5.4	FALSE
MW-5	7/11/2016	1	5.4	FALSE
MW-6	7/11/2016	1	5.4	FALSE
MW-7	7/11/2016	1	5.4	FALSE
MW-8	7/12/2016	1	5.4	FALSE

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Sen's Slope Analysis

Parameter: Thallium

Location: BG-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
ND<5.4 U (10/15/2015)	ND<0.5 U (8/12/2015)	(5.4 - 0.5)/(2 - 1)	4.9
ND<5.4 U (11/18/2015)	ND<0.5 U (8/12/2015)	(5.4 - 0.5)/(3 - 1)	2.45
ND<5.4 U (1/4/2016)	ND<0.5 U (8/12/2015)	(5.4 - 0.5)/(4 - 1)	1.63333
13.7 (2/16/2016)	ND<0.5 U (8/12/2015)	(13.7 - 0.5)/(5 - 1)	3.3
ND<5.4 U (4/5/2016)	ND<0.5 U (8/12/2015)	(5.4 - 0.5)/(6 - 1)	0.98
ND<5.4 U (5/26/2016)	ND<0.5 U (8/12/2015)	(5.4 - 0.5)/(7 - 1)	0.816667
ND<5.4 U (7/12/2016)	ND<0.5 U (8/12/2015)	(5.4 - 0.5)/(8 - 1)	0.7
ND<5.4 U (11/18/2015)	ND<5.4 U (10/15/2015)	(5.4 - 5.4)/(3 - 2)	0
ND<5.4 U (1/4/2016)	ND<5.4 U (10/15/2015)	(5.4 - 5.4)/(4 - 2)	0
13.7 (2/16/2016)	ND<5.4 U (10/15/2015)	(13.7 - 5.4)/(5 - 2)	2.76667
ND<5.4 U (4/5/2016)	ND<5.4 U (10/15/2015)	(5.4 - 5.4)/(6 - 2)	0
ND<5.4 U (5/26/2016)	ND<5.4 U (10/15/2015)	(5.4 - 5.4)/(7 - 2)	0
ND<5.4 U (7/12/2016)	ND<5.4 U (10/15/2015)	(5.4 - 5.4)/(8 - 2)	0
ND<5.4 U (1/4/2016)	ND<5.4 U (11/18/2015)	(5.4 - 5.4)/(4 - 3)	0
13.7 (2/16/2016)	ND<5.4 U (11/18/2015)	(13.7 - 5.4)/(5 - 3)	4.15
ND<5.4 U (4/5/2016)	ND<5.4 U (11/18/2015)	(5.4 - 5.4)/(6 - 3)	0
ND<5.4 U (5/26/2016)	ND<5.4 U (11/18/2015)	(5.4 - 5.4)/(7 - 3)	0
ND<5.4 U (7/12/2016)	ND<5.4 U (11/18/2015)	(5.4 - 5.4)/(8 - 3)	0
13.7 (2/16/2016)	ND<5.4 U (1/4/2016)	(13.7 - 5.4)/(5 - 4)	8.3
ND<5.4 U (4/5/2016)	ND<5.4 U (1/4/2016)	(5.4 - 5.4)/(6 - 4)	0
ND<5.4 U (5/26/2016)	ND<5.4 U (1/4/2016)	(5.4 - 5.4)/(7 - 4)	0
ND<5.4 U (7/12/2016)	ND<5.4 U (1/4/2016)	(5.4 - 5.4)/(8 - 4)	0
ND<5.4 U (4/5/2016)	13.7 (2/16/2016)	(5.4 - 13.7)/(6 - 5)	-8.3
ND<5.4 U (5/26/2016)	13.7 (2/16/2016)	(5.4 - 13.7)/(7 - 5)	-4.15
ND<5.4 U (7/12/2016)	13.7 (2/16/2016)	(5.4 - 13.7)/(8 - 5)	-2.76667
ND<5.4 U (5/26/2016)	ND<5.4 U (4/5/2016)	(5.4 - 5.4)/(7 - 6)	0
ND<5.4 U (7/12/2016)	ND<5.4 U (4/5/2016)	(5.4 - 5.4)/(8 - 6)	0
ND<5.4 U (7/12/2016)	ND<5.4 U (5/26/2016)	(5.4 - 5.4)/(8 - 7)	0

Number of Q values = 28

Ordered Q Values

n	Q
1	-8.3
2	-4.15
3	-2.76667
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0.7
20	0.816667
21	0.98
22	1.63333

23	2.45
24	2.76667
25	3.3
26	4.15
27	4.9
28	8.3

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	5.4	6

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/18/2015	1
1/4/2016	1
2/16/2016	1
4/5/2016	1
5/26/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 510
B = 0
C = 120
D = 0
E = 30
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 37
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.0053
M1 = (28 - 10.0053)/2.0 = 8.99737
M2 = (28 + 10.0053)/2.0 + 1 = 20.0026
Lower limit is 0 = Q(9)
Upper limit is 0.816667 = Q(20)
0 < 0 < 0.816667 indicating no trend in data.

Concentrations (mg/L)

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	690 B	690 B
			10/15/2015	654	654
			11/18/2015	652	652
			1/4/2016	643	643
			2/16/2016	650	650
			4/5/2016	628	628
			5/26/2016	633	633
			7/12/2016	668	668

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Total Dissolved Solids
All Locations

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.385965	0.125	0.554	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	690 B	FALSE
	10/15/2015	654	FALSE
	11/18/2015	652	FALSE
	1/4/2016	643	FALSE
	2/16/2016	650	FALSE
	4/5/2016	628	FALSE
	5/26/2016	633	FALSE
	7/12/2016	668	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids
All Locations
Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	628	690	62	0.6052	37.5224
2	633	668	35	0.3164	11.074
3	643	654	11	0.1743	1.9173
4	650	652	2	0.0561	0.1122
5	652	650	-2		
6	654	643	-11		
7	668	633	-35		
8	690	628	-62		

Sum of b values = 50.6259
Sample Standard Deviation = 19.7321
W Statistic = 0.940371

5% Critical value of 0.818 is less than 0.940371
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.940371
Data is normally distributed at 99% level of significance

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 652.25
Background Std Dev = 19.7321

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	1410	[0, 722.867]	TRUE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	3290	[0, 722.867]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	2440	[0, 722.867]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	1040	[0, 722.867]	TRUE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	221	[0, 722.867]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	660	[0, 722.867]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	1100	[0, 722.867]	TRUE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	1340	[0, 722.867]	TRUE

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: BG-1

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
654 (10/15/2015)	690 B (8/12/2015)	(654 - 690)/(2 - 1)	-36
652 (11/18/2015)	690 B (8/12/2015)	(652 - 690)/(3 - 1)	-19
643 (1/4/2016)	690 B (8/12/2015)	(643 - 690)/(4 - 1)	-15.6667
650 (2/16/2016)	690 B (8/12/2015)	(650 - 690)/(5 - 1)	-10
628 (4/5/2016)	690 B (8/12/2015)	(628 - 690)/(6 - 1)	-12.4
633 (5/26/2016)	690 B (8/12/2015)	(633 - 690)/(7 - 1)	-9.5
668 (7/12/2016)	690 B (8/12/2015)	(668 - 690)/(8 - 1)	-3.14286
652 (11/18/2015)	654 (10/15/2015)	(652 - 654)/(3 - 2)	-2
643 (1/4/2016)	654 (10/15/2015)	(643 - 654)/(4 - 2)	-5.5
650 (2/16/2016)	654 (10/15/2015)	(650 - 654)/(5 - 2)	-1.33333
628 (4/5/2016)	654 (10/15/2015)	(628 - 654)/(6 - 2)	-6.5
633 (5/26/2016)	654 (10/15/2015)	(633 - 654)/(7 - 2)	-4.2
668 (7/12/2016)	654 (10/15/2015)	(668 - 654)/(8 - 2)	2.33333
643 (1/4/2016)	652 (11/18/2015)	(643 - 652)/(4 - 3)	-9
650 (2/16/2016)	652 (11/18/2015)	(650 - 652)/(5 - 3)	-1
628 (4/5/2016)	652 (11/18/2015)	(628 - 652)/(6 - 3)	-8
633 (5/26/2016)	652 (11/18/2015)	(633 - 652)/(7 - 3)	-4.75
668 (7/12/2016)	652 (11/18/2015)	(668 - 652)/(8 - 3)	3.2
650 (2/16/2016)	643 (1/4/2016)	(650 - 643)/(5 - 4)	7
628 (4/5/2016)	643 (1/4/2016)	(628 - 643)/(6 - 4)	-7.5
633 (5/26/2016)	643 (1/4/2016)	(633 - 643)/(7 - 4)	-3.33333
668 (7/12/2016)	643 (1/4/2016)	(668 - 643)/(8 - 4)	6.25
628 (4/5/2016)	650 (2/16/2016)	(628 - 650)/(6 - 5)	-22
633 (5/26/2016)	650 (2/16/2016)	(633 - 650)/(7 - 5)	-8.5
668 (7/12/2016)	650 (2/16/2016)	(668 - 650)/(8 - 5)	6
633 (5/26/2016)	628 (4/5/2016)	(633 - 628)/(7 - 6)	5
668 (7/12/2016)	628 (4/5/2016)	(668 - 628)/(8 - 6)	20
668 (7/12/2016)	633 (5/26/2016)	(668 - 633)/(8 - 7)	35

Number of Q values = 28

Ordered Q Values

n	Q
1	-36
2	-22
3	-19
4	-15.6667
5	-12.4
6	-10
7	-9.5
8	-9
9	-8.5
10	-8
11	-7.5
12	-6.5
13	-5.5
14	-4.75
15	-4.2
16	-3.33333
17	-3.14286
18	-2
19	-1.33333
20	-1
21	2.33333
22	3.2

23	5
24	6
25	6.25
26	7
27	20
28	35

Sen's Estimator (Median Q) is -4.475

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/18/2015	1
1/4/2016	1
2/16/2016	1
4/5/2016	1
5/26/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -9.5 = Q(7)
Upper limit is 3.2 = Q(22)
-9.5 < 0 < 3.2 indicating no trend in data.

Concentrations (ug/L)

Parameter: Vanadium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 5
Percent Non-Detects: 62.5%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	5 (62.5%)	8/12/2015	6	6
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	5.1	5.1
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	5.1	5.1

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Vanadium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.9	0	0.554	6
2	0	0	0.507	None

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	**6**	**TRUE**
	10/15/2015	ND<5 U	FALSE
	11/18/2015	ND<5 U	FALSE
	1/4/2016	ND<5 U	FALSE
	2/16/2016	5.1	FALSE
	4/5/2016	ND<5 U	FALSE
	5/26/2016	ND<5 U	FALSE
	7/12/2016	5.1	FALSE

Mann-Kendall Trend Analysis

Parameter: Vanadium
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<5 U	6	-1	0	1
ND<5 U	6	-1	0	2
ND<5 U	6	-1	0	3
5.1	6	-0.9	0	4
ND<5 U	6	-1	0	5
ND<5 U	6	-1	0	6
5.1	6	-0.9	0	7
ND<5 U	ND<5 U	0	0	7
ND<5 U	ND<5 U	0	0	7
5.1	ND<5 U	0.1	1	7
ND<5 U	ND<5 U	0	1	7
ND<5 U	ND<5 U	0	1	7
5.1	ND<5 U	0.1	2	7
ND<5 U	ND<5 U	0	2	7
5.1	ND<5 U	0.1	3	7
ND<5 U	ND<5 U	0	3	7
ND<5 U	ND<5 U	0	3	7
5.1	ND<5 U	0.1	4	7
5.1	ND<5 U	0.1	5	7
ND<5 U	ND<5 U	0	5	7
ND<5 U	ND<5 U	0	5	7
5.1	ND<5 U	0.1	6	7
ND<5 U	5.1	-0.1	6	8
ND<5 U	5.1	-0.1	6	9
5.1	5.1	0	6	9
ND<5 U	ND<5 U	0	6	9
5.1	ND<5 U	0.1	7	9
5.1	ND<5 U	0.1	8	9

S Statistic = 8 - 9 = -1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-1| is 1
1 >= 0.025 indicating no evidence of a trend

	A	B	C	D	E	F	G	H	I	J	K	L
1				Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	8/29/2016 11:22:29 AM								
4			From File	Charah-ProUCL-Aug-2016.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	95%								
7			Coverage	95%								
8			Different or Future K Observations	1								
9			Number of Bootstrap Operations	2000								
10												
11						V (bg-1)						
12												
13						General Statistics						
14					Total Number of Observations	8		Number of Missing Observations				0
15					Number of Distinct Observations	3						
16					Number of Detects	3		Number of Non-Detects				5
17					Number of Distinct Detects	2		Number of Distinct Non-Detects				1
18					Minimum Detect	5.1		Minimum Non-Detect				5
19					Maximum Detect	6		Maximum Non-Detect				5
20					Variance Detected	0.27		Percent Non-Detects				62.5%
21					Mean Detected	5.4		SD Detected				0.52
22					Mean of Detected Logged Data	1.683		SD of Detected Logged Data				0.0938
23												
24						Warning: Data set has only 3 Detected Values.						
25						This is not enough to compute meaningful or reliable statistics and estimates.						
26												
27												
28						Critical Values for Background Threshold Values (BTVs)						
29					Tolerance Factor K (For UTL)	3.187		d2max (for USL)				2.032
30												
31						Normal GOF Test on Detects Only						
32					Shapiro Wilk Test Statistic	0.75		Shapiro Wilk GOF Test				
33					5% Shapiro Wilk Critical Value	0.767		Data Not Normal at 5% Significance Level				
34					Lilliefors Test Statistic	0.385		Lilliefors GOF Test				
35					5% Lilliefors Critical Value	0.512		Detected Data appear Normal at 5% Significance Level				
36						Detected Data appear Approximate Normal at 5% Significance Level						
37												
38						Kaplan Meier (KM) Background Statistics Assuming Normal Distribution						
39					Mean	5.15		SD				0.324
40					95% UTL95% Coverage	6.183		95% KM UPL (t)				5.801
41					90% KM Percentile (z)	5.565		95% KM Percentile (z)				5.683
42					99% KM Percentile (z)	5.904		95% KM USL				5.808
43												
44						DL/2 Substitution Background Statistics Assuming Normal Distribution						
45					Mean	3.588		SD				1.526
46					95% UTL95% Coverage	8.452		95% UPL (t)				6.655
47					90% Percentile (z)	5.544		95% Percentile (z)				6.098
48					99% Percentile (z)	7.138		95% USL				6.689
49						DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons						
50												
51						Gamma GOF Tests on Detected Observations Only						
52						Not Enough Data to Perform GOF Test						
53												
54						Gamma Statistics on Detected Data Only						
55					k hat (MLE)	167.6		k star (bias corrected MLE)				N/A
56					Theta hat (MLE)	0.0322		Theta star (bias corrected MLE)				N/A
57					nu hat (MLE)	1006		nu star (bias corrected)				N/A
58					MLE Mean (bias corrected)	N/A						

	A	B	C	D	E	F	G	H	I	J	K	L
59					MLE Sd (bias corrected)	N/A				95% Percentile of Chisquare (2k)		N/A
60												
61					**Gamma ROS Statistics using Imputed Non-Detects**							
62					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
63					GROS may not be used when kstar of detected data is small such as < 0.1							
64					For such situations, GROS method tends to yield inflated values of UCLs and BTVs							
65					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
66					Minimum	2.76				Mean		4.273
67					Maximum	6				Median		4.146
68					SD	1.076				CV		0.252
69					k hat (MLE)	17.75				k star (bias corrected MLE)		11.18
70					Theta hat (MLE)	0.241				Theta star (bias corrected MLE)		0.382
71					nu hat (MLE)	284.1				nu star (bias corrected)		178.9
72					MLE Mean (bias corrected)	4.273				MLE Sd (bias corrected)		1.278
73					95% Percentile of Chisquare (2k)	34.37				90% Percentile		5.97
74					95% Percentile	6.568				99% Percentile		7.792
75					**The following statistics are computed using Gamma ROS Statistics on Imputed Data**							
76					**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**							
77					WH	HW					WH	HW
78			95% Approx. Gamma UTL with 95% Coverage		8.616	8.785				95% Approx. Gamma UPL	6.734	6.785
79			95% Gamma USL		6.767	6.819						
80												
81					**The following statistics are computed using gamma distribution and KM estimates**							
82					**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**							
83					k hat (KM)	252.6				nu hat (KM)		4042
84					WH	HW					WH	HW
85			95% Approx. Gamma UTL with 95% Coverage		6.197	6.199				95% Approx. Gamma UPL	5.792	5.791
86			95% Gamma USL		5.8	5.799						
87												
88					**Lognormal GOF Test on Detected Observations Only**							
89					Shapiro Wilk Test Statistic	0.75				**Shapiro Wilk GOF Test**		
90					5% Shapiro Wilk Critical Value	0.767				Data Not Lognormal at 5% Significance Level		
91					Lilliefors Test Statistic	0.385				**Lilliefors GOF Test**		
92					5% Lilliefors Critical Value	0.512				Detected Data appear Lognormal at 5% Significance Level		
93					**Detected Data appear Approximate Lognormal at 5% Significance Level**							
94												
95					**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**							
96					Mean in Original Scale	4.437				Mean in Log Scale		1.472
97					SD in Original Scale	0.91				SD in Log Scale		0.203
98					95% UTL95% Coverage	8.318				95% BCA UTL95% Coverage		6
99					95% Bootstrap (%) UTL95% Coverage	6				95% UPL (t)		6.55
100					90% Percentile (z)	5.651				95% Percentile (z)		6.083
101					99% Percentile (z)	6.985				95% USL		6.58
102												
103					**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**							
104					KM Mean of Logged Data	1.637				95% KM UTL (Lognormal)95% Coverage		6.205
105					KM SD of Logged Data	0.059				95% KM UPL (Lognormal)		5.788
106					95% KM Percentile Lognormal (z)	5.665				95% KM USL (Lognormal)		5.796
107												
108					**Background DL/2 Statistics Assuming Lognormal Distribution**							
109					Mean in Original Scale	3.588				Mean in Log Scale		1.204
110					SD in Original Scale	1.526				SD in Log Scale		0.4
111					95% UTL95% Coverage	11.93				95% UPL (t)		7.449
112					90% Percentile (z)	5.567				95% Percentile (z)		6.438
113					99% Percentile (z)	8.456				95% USL		7.516
114					**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**							
115												
116					**Nonparametric Distribution Free Background Statistics**							

	A	B	C	D	E	F	G	H	I	J	K	L
117	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
118												
119	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
120					Order of Statistic, r	8			95% UTL with95% Coverage			6
121					Approximate f	0.421			Confidence Coefficient (CC) achieved by UTL			0.337
122					95% UPL	6			95% USL			6
123					95% KM Chebyshev UPL	6.648						
124												
125	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
126	data set free of outliers and consists of observations collected from clean unimpacted locations.											
127	The use of USL tends to provide a balance between false positives and false negatives provided the data											
128	represents a background data set and when many onsite observations need to be compared with the BTV.											

Sen's Slope Analysis

Parameter: Zinc
Location: BG-1

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10 (10/15/2015)	8.3 J (8/12/2015)	(10 - 8.3)/(2 - 1)	1.7
ND<10 U (11/18/2015)	8.3 J (8/12/2015)	(10 - 8.3)/(3 - 1)	0.85
ND<10 U (1/4/2016)	8.3 J (8/12/2015)	(10 - 8.3)/(4 - 1)	0.566667
ND<10 U (2/16/2016)	8.3 J (8/12/2015)	(10 - 8.3)/(5 - 1)	0.425
ND<10 U (4/5/2016)	8.3 J (8/12/2015)	(10 - 8.3)/(6 - 1)	0.34
ND<10 U (5/26/2016)	8.3 J (8/12/2015)	(10 - 8.3)/(7 - 1)	0.283333
ND<10 U (7/12/2016)	8.3 J (8/12/2015)	(10 - 8.3)/(8 - 1)	0.242857
ND<10 U (11/18/2015)	10 (10/15/2015)	(10 - 10)/(3 - 2)	0
ND<10 U (1/4/2016)	10 (10/15/2015)	(10 - 10)/(4 - 2)	0
ND<10 U (2/16/2016)	10 (10/15/2015)	(10 - 10)/(5 - 2)	0
ND<10 U (4/5/2016)	10 (10/15/2015)	(10 - 10)/(6 - 2)	0
ND<10 U (5/26/2016)	10 (10/15/2015)	(10 - 10)/(7 - 2)	0
ND<10 U (7/12/2016)	10 (10/15/2015)	(10 - 10)/(8 - 2)	0
ND<10 U (1/4/2016)	ND<10 U (11/18/2015)	(10 - 10)/(4 - 3)	0
ND<10 U (2/16/2016)	ND<10 U (11/18/2015)	(10 - 10)/(5 - 3)	0
ND<10 U (4/5/2016)	ND<10 U (11/18/2015)	(10 - 10)/(6 - 3)	0
ND<10 U (5/26/2016)	ND<10 U (11/18/2015)	(10 - 10)/(7 - 3)	0
ND<10 U (7/12/2016)	ND<10 U (11/18/2015)	(10 - 10)/(8 - 3)	0
ND<10 U (2/16/2016)	ND<10 U (1/4/2016)	(10 - 10)/(5 - 4)	0
ND<10 U (4/5/2016)	ND<10 U (1/4/2016)	(10 - 10)/(6 - 4)	0
ND<10 U (5/26/2016)	ND<10 U (1/4/2016)	(10 - 10)/(7 - 4)	0
ND<10 U (7/12/2016)	ND<10 U (1/4/2016)	(10 - 10)/(8 - 4)	0
ND<10 U (4/5/2016)	ND<10 U (2/16/2016)	(10 - 10)/(6 - 5)	0
ND<10 U (5/26/2016)	ND<10 U (2/16/2016)	(10 - 10)/(7 - 5)	0
ND<10 U (7/12/2016)	ND<10 U (2/16/2016)	(10 - 10)/(8 - 5)	0
ND<10 U (5/26/2016)	ND<10 U (4/5/2016)	(10 - 10)/(7 - 6)	0
ND<10 U (7/12/2016)	ND<10 U (4/5/2016)	(10 - 10)/(8 - 6)	0
ND<10 U (7/12/2016)	ND<10 U (5/26/2016)	(10 - 10)/(8 - 7)	0

Number of Q values = 28

Ordered Q Values

n	Q
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0.242857

23	0.283333
24	0.34
25	0.425
26	0.566667
27	0.85
28	1.7

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	7

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/18/2015	1
1/4/2016	1
2/16/2016	1
4/5/2016	1
5/26/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 798
B = 0
C = 210
D = 0
E = 42
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 21
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 7.53766
M1 = (28 - 7.53766)/2.0 = 10.2312
M2 = (28 + 7.53766)/2.0 + 1 = 18.7688
Lower limit is 0 = Q(10)
Upper limit is 0 = Q(19)
0 < 0 < 0 indicating no trend in data.

Concentrations (ug/L)

Parameter: Zinc

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 8
Total Non-Detect: 6
Percent Non-Detects: 75%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	6 (75%)	8/12/2015	8.3 J	8.3 J
			10/15/2015	10	10
			11/18/2015	ND<10 U	ND<10 U
			1/4/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/5/2016	ND<10 U	ND<10 U
			5/26/2016	ND<10 U	ND<10 U
			7/12/2016	ND<10 U	ND<10 U

There are 0 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Zinc

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.
Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
BG-1	8/12/2015	8.3 J	FALSE
	10/15/2015	10	FALSE
	11/18/2015	ND<10 U	FALSE
	1/4/2016	ND<10 U	FALSE
	2/16/2016	ND<10 U	FALSE
	4/5/2016	ND<10 U	FALSE
	5/26/2016	ND<10 U	FALSE
	7/12/2016	ND<10 U	FALSE

Mann-Kendall Trend Analysis

Parameter: Zinc
Location: BG-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
10	8.3 J	1.7	1	0
ND<10 U	8.3 J	1.7	2	0
ND<10 U	8.3 J	1.7	3	0
ND<10 U	8.3 J	1.7	4	0
ND<10 U	8.3 J	1.7	5	0
ND<10 U	8.3 J	1.7	6	0
ND<10 U	8.3 J	1.7	7	0
ND<10 U	10	0	7	0
ND<10 U	10	0	7	0
ND<10 U	10	0	7	0
ND<10 U	10	0	7	0
ND<10 U	10	0	7	0
ND<10 U	10	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0
ND<10 U	ND<10 U	0	7	0

S Statistic = 7 - 0 = 7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |7| is 0.473
0.473 >= 0.025 indicating no evidence of a trend

	A	B	C	D	E	F	G	H	I	J	K	L
1				Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	8/29/2016 11:25:04 AM								
4			From File	Charah-ProUCL-Aug-2016.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	95%								
7			Coverage	95%								
8			Different or Future K Observations	1								
9			Number of Bootstrap Operations	2000								
10												
11					Zn (bg-1)							
12												
13					General Statistics							
14					Total Number of Observations	8			Number of Missing Observations			0
15					Number of Distinct Observations	2						
16					Number of Detects	2			Number of Non-Detects			6
17					Number of Distinct Detects	2			Number of Distinct Non-Detects			1
18					Minimum Detect	8.3			Minimum Non-Detect			10
19					Maximum Detect	10			Maximum Non-Detect			10
20					Variance Detected	1.445			Percent Non-Detects			75%
21					Mean Detected	9.15			SD Detected			1.202
22					Mean of Detected Logged Data	2.209			SD of Detected Logged Data			0.132
23												
24					Warning: Data set has only 2 Detected Values.							
25					This is not enough to compute meaningful or reliable statistics and estimates.							
26												
27												
28					Critical Values for Background Threshold Values (BTVs)							
29					Tolerance Factor K (For UTL)	3.187			d2max (for USL)			2.032
30												
31					Normal GOF Test on Detects Only							
32					Not Enough Data to Perform GOF Test							
33												
34					Kaplan Meier (KM) Background Statistics Assuming Normal Distribution							
35					Mean	8.513			SD			0.562
36					95% UTL95% Coverage	10.3			95% KM UPL (t)			9.642
37					90% KM Percentile (z)	9.233			95% KM Percentile (z)			9.437
38					99% KM Percentile (z)	9.82			95% KM USL			9.655
39												
40					DL/2 Substitution Background Statistics Assuming Normal Distribution							
41					Mean	6.038			SD			1.974
42					95% UTL95% Coverage	12.33			95% UPL (t)			10
43					90% Percentile (z)	8.567			95% Percentile (z)			9.285
44					99% Percentile (z)	10.63			95% USL			10.05
45					DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons							
46												
47					Gamma GOF Tests on Detected Observations Only							
48					Not Enough Data to Perform GOF Test							
49												
50					Gamma Statistics on Detected Data Only							
51					k hat (MLE)	115.5			k star (bias corrected MLE)			N/A
52					Theta hat (MLE)	0.0792			Theta star (bias corrected MLE)			N/A
53					nu hat (MLE)	462.2			nu star (bias corrected)			N/A
54					MLE Mean (bias corrected)	N/A						
55					MLE Sd (bias corrected)	N/A			95% Percentile of Chisquare (2k)			N/A
56												
57					The following statistics are computed using gamma distribution and KM estimates							
58					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
59					k hat (KM)	229.2					nu hat (KM)	3668
60					WH	HW					WH	HW
61				95% Approx. Gamma UTL with 95% Coverage	10.33	10.33			95% Approx. Gamma UPL		9.625	9.622
62				95% Gamma USL	9.638	9.635						

	A	B	C	D	E	F	G	H	I	J	K	L
63												
64	**Lognormal GOF Test on Detected Observations Only**											
65	**Not Enough Data to Perform GOF Test**											
66												
67	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
68					Mean in Original Scale	8.503				Mean in Log Scale		2.137
69					SD in Original Scale	0.792				SD in Log Scale		0.0913
70					95% UTL95% Coverage	11.33				95% BCA UTL95% Coverage		10
71					95% Bootstrap (%) UTL95% Coverage	10				95% UPL (t)		10.18
72					90% Percentile (z)	9.523				95% Percentile (z)		9.844
73					99% Percentile (z)	10.48				95% USL		10.2
74												
75	**Background DL/2 Statistics Assuming Lognormal Distribution**											
76					Mean in Original Scale	6.038				Mean in Log Scale		1.759
77					SD in Original Scale	1.974				SD in Log Scale		0.282
78					95% UTL95% Coverage	14.28				95% UPL (t)		10.24
79					90% Percentile (z)	8.34				95% Percentile (z)		9.24
80					99% Percentile (z)	11.2				95% USL		10.31
81	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
82												
83	**Nonparametric Distribution Free Background Statistics**											
84	**Data do not follow a Discernible Distribution (0.05)**											
85												
86	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
87					Order of Statistic, r	8				95% UTL with95% Coverage		10
88					Approximate f	0.421				Confidence Coefficient (CC) achieved by UTL		0.337
89					95% UPL	10				95% USL		10
90					95% KM Chebyshev UPL	11.11						
91												
92	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
93	data set free of outliers and consists of observations collected from clean unimpacted locations.											
94	The use of USL tends to provide a balance between false positives and false negatives provided the data											
95	represents a background data set and when many onsite observations need to be compared with the BTV.											

Summary Results of Interwell Statistical Analysis for Groundwater Parameters
Brickhaven No. 2 Mine Tract "A" Structure Fill Site

Interwell statistical analysis was conducted for the detected groundwater results during the July 2016 sampling event in the Brickhaven No. 2 Mine Tract "A" Structure Fill Site. All laboratory groundwater parameters for the background well (BG-1) and all compliance wells (MW-1 to MW-8) are included in the statistical analysis, which have been monitored for 8 events since August 2015. The pH measured in field or pH (field) is also included in the statistical analysis. The results are summarized as follows:

1.0 Procedures

Interwell comparisons of parameter concentrations present in background and compliance wells are calculated based on historical data and the most recent sampling event. Groundwater monitoring data from both background well (BG-1) and downgradient wells (MW-1 to MW-8) from the past 8 monitoring events are input to the statistical program. Comparisons are used to determine whether statistically significant increases (SSI) in compliance well concentrations have occurred relative to the pooled data from the background well for the most recent monitoring event and to assess whether trends exist. Analyses are performed for parameters that have been measured at least eight times at each monitoring well. These calculations are performed using Starpoint Software, Inc.'s ChemStat® software package, Version 6.3.0.2. The groundwater monitoring at the site is considered as detection monitoring. Therefore statistical options and methods applicable to groundwater detection monitoring are selected. The interwell groundwater statistical methods selected are consistent with the Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance (USEPA, March 2009. The methods and the statistical procedures are outlined in Flowchart 2.

Steps in this analytical process depend on the proportion of samples that are considered to be "non-detects" (NDs) or otherwise below the Method Reporting Limit (MRL).

1.1 Test for Outliers – Parameters measured during prior sampling events and the most recent monitoring period (i.e., the entire record for a parameter pooled over the 8 downgradient wells and the background well) are tested for outliers using Dixon's Test (valid for sample sizes <= 25) or Rosner's test (valid for sample sizes > 25). Any values identified as outliers are noted in a statistical summary table. However, outliers are not removed from subsequent analyses unless the analytical result's quality assurance review determined that values in question were

impacted and sources of impact were known. Outlier tests are not performed for parameters that do not have any measured values greater than its applicable MRL.

1.2 Adjustment of Non-Detects (NDs) – NDs (commonly described as "non-detects") represent analytical results reported as below the MRL (bMRL) and are adjusted based on the percentage of bMRL values. When less than 15 percent of values for a parameter are NDs, those values are replaced with a value equals to ½ the MRL. When 15 percent to 50 percent of values are reported as NDs, the Aitcheson Adjustment is used. When more than 50 percent of values for a parameter are reported NDs, the value for a non-detect is replaced with the MRL.

1.3 Distribution Assessment – Data are evaluated to determine whether the distribution of each constituent satisfies normality assumptions for further statistical analysis. Normality is evaluated using the Shapiro-Wilks test, which applies to cases where there are fewer than 50 samples from the 8 historic monitoring events from the background well. Distributions are first evaluated using non-transformed data and then, if the distribution does not satisfy normality assumptions, it is tested again using natural log (ln) transformed data.

1.4 Interwell Comparisons to Background Well Prediction Limits – Parameter concentrations from compliance wells are compared to corresponding Prediction Limits (PLs) from the background well. Concentrations measured during the most recent sampling event represent the compliance well condition in the interwell comparison. As previously described in the report "Prediction Limit for Background Well Parameters", the entire record of measurements from the background well is evaluated to determine whether a Parametric Prediction Limit (PPL) or a Non-parametric Prediction Limit (NPPL) can be used to estimate background well PLs. This evaluation depends on the percentage of measurements bMRL and whether a distribution satisfies normality assumptions. For parameters with less than 50 percent of measurements from all wells reported as bMRL and a distribution that satisfies normality assumptions from the background well, a PPL is calculated. For Parameters with more than 50 percent of measurements reported as bMRL or having a distribution that does not satisfy normality assumptions, a NPPL is calculated.

1.4.1 PPL Procedures – During the interwell PPL comparison, the detected result of the most recent monitoring event for the downgradient wells is compared to the PPL of the background well (BG-1). Please refer to the Background well statistical procedures in "Prediction Limit for Background Well Parameters" reported separately.

For parameters other than pH, where compliance is determined only by an upper limit, a 1-sided (upper) 95 percent prediction limit calculation is performed. For pH, where compliance is determined by both upper and lower limits, a 2-sided calculation is performed and is termed a parametric prediction interval (PPI).

1.4.2 NPPL Procedures– For parameters where more than 50 percent of the data were bMRL (<50%ND) or where no discernable distribution was found, provided at least 2 detects were observed, a NPPL was calculated using the 95% Chebyshev Upper Prediction Limit. Otherwise, another NPPL method is used, in which the higher of either the MRL or the maximum detected result from the background well is used as the upper limit.

1.4.3 Interwell Comparison – The detected parameters above the MRL But from each compliance well during the July 2016 sampling event is compared to the background well Parametric or non-parametric Prediction Limit. Parameters are considered to be within compliance limits if the July 2016 sampled concentration from the compliance well is less than the background well PL. Otherwise, compliance well values are evaluated to determine the nature of any increases and trends over time.

1.5 Statistically Significant Increase (SSI) and Trend Assessment – If the most recently sampled compliance well value exceeds the background well PL, then that value represents a statistically significant increase (SSI) over background. The Thiel-Sen procedure ("Sen's Slope Estimator") is used to evaluate trends for each parameter where an SSI is found for the July 2016 monitoring event. The Sen's trend analysis will help to project if future values for a parameter are likely to be higher, lower or remain unchanged relative to the PLs. If the data had 7 or more non-detects over the 8 sampling events, no trend analysis was done as little statistical information can be gleaned at that level of censorship.

1.6 99 Percent Confidence Intervals – When a parameter is determined to have an SSI over the background well data, a 99 Percent confidence interval is calculated for the parameter from the compliance wells over the historical monitoring data (8 events).

According to Unified Guide 2009, Chapter 21, Page 21-1, during detection and/or assessment monitoring, parameters are considered as exceeding the compliance limits (i.e. the 2L standard, the MCL or the GWPS), whenever the lower limits of the 99 percent confidence intervals (99%LCL) exceed the known compliance limits The 99%LCL result provides another indicator for groundwater compliance based on historic results.

When compliance limits are exceeded, HDR will provide interpretation as to the impact of the exceedance by referencing the trend results. A statistically significant trend where concentrations are increasing over time does suggest that future samples are at a higher risk of exceedances than trends that are either flat or declining over time.

1.7 Time Series Plots – Graphs of concentration versus time for all wells are provided for each parameter. The trends in the time series plots graphically display changes in concentrations over time and substantiate the findings from Sen's Slope Estimator tests. The time series plots for all detected parameters can be found in the Statistics Output (Attachment).

2.0 Statistical Results

2.1 Outliers

Barium detected at MW-8, Lithium, sulfate, and Zinc detected at MW-2 during the July 2016 monitoring event are outliers relative to all these parameters' values collected over the eight sampling events from all wells. The outliers are included in the interwell statistics.

2.1 Prediction Limit Results

Based on the results from the "Prediction Limits for Background Well Parameters" report, the parameters Ba, B, Ca, Cl, F, Li, Ra-226, Ra-228, SO4, and TDS from the background wells follow normal distributions. Parametric 95 percent prediction limits were estimated for these parameters. Compliance observations for these parameters from the July 2016 sampling event were compared to their respective prediction limits.

A one-sided (upper) parametric prediction limit (UPLs) was used to estimate limits for all parameters with the exception that a two-sided parametric prediction limit was chosen for pH (field) in accordance with the Unified Guidance direction for prediction limits for these parameters.

For parameters with detections fewer than twice during the 8 sampling events from the background well (including Tl, Cr, and Mo), non-parametric methods were used to estimate their respective prediction limits, where either the larger of the MRL or the detected result from the background well is used as the UPL. The UPLs for Vanadium and Zn were calculated using 95% Chebyshev UPL method in which these two parameters were detected more that twice from the background well during the 8 sampling events.

All the results are shown in the summary table (Table 2). The results are summarized as follows:

Parameters with Statistically Significant Increase above Background PL (SSI):

- **Antimony**: Antimony observations from MW-1 to MW-3, and MW-8 show statistical significance compared to the background well NPPL. But the results show no trend over time at MW-2, MW-3 and MW-8 using Sen's slope estimator tests. Sen's slope estimator test was not conducted for MW-1 because only a single detection was found above the MRL during the 8 monitoring events.

- **Barium:** Barium observations from MW-3 and MW-8 have statistically significant increases (SSIs) above the background 95% UPL. But barium results show no trend over time for these wells using Sen's slope estimator tests.

- **Boron**: Boron observations from MW-2, MW-3, and MW-7 have SSIs compared to the background 95% UPL. But the results show no trend or downward trend over time using Sen's slope estimator tests.

- **Calcium**: Calcium observations from MW-1 to MW-4 and from MW-7 to MW-8 have SSIs compared to the background 95% UPL. But the results show no trend or downward trend over time except at MW-7, which showed an upward trend using Sen's slope estimator tests.

- **Chloride**: Chloride observations from MW-1 to MW-4, MW-7, and MW-8 have SSIs compared to the background 95% UPL. But the results show no trend or downward trend over time using Sen's slope estimator tests.

- **Chromium**: Chromium detected at MW-2 has an SSI compared to the background NPPL; but there is no trend in the chromium results over time at this well using Sen's slope estimator test.

- **Fluoride**: Fluoride observations from MW-4 to MW-6 have SSIs compared to the background 95% UPL. But the fluoride results showed no trend or downward trend over time for these wells using Sen's slope estimator tests.

- **Lithium**: Lithium observations from MW-2 and MW-3 have SSIs compared to the background 95% UPL. The results at MW-2 showed an upward trend, but there is no trend at MW-3 over time using Sen's slope estimator tests.

- **Molybdenum**: Molybdenum observations detected at MW-2 and MW-3 show SSIs above the background NPPL.

- **pH (field)**: The pH (field) observations from MW-2 and MW-3 have SSIs outside the background 95% Prediction Interval Limit. But the pH (field) results do not show a trend over time for both wells using Sen's slope estimator tests.

- **Sulfate**: Sulfate observations from MW-2, MW-3, and MW-6 have SSIs over the background 95% UPL. But the results showed no trend over time for these wells using Sen's slope estimator tests.

- **Total Dissolved Solids (TDS)**: TDS observations from MW-1, MW-2, MW-3, MW-4, MW-7, and MW-8 have SSIs from the background 95% UPL. But the results show no trend over time for all wells except at MW-2 where TDS shows an upward trend using Sen's slope estimator tests.

- **Zinc**: Zinc observations detected from MW-1, MW-2, MW-5, MW-6, and MW-8 have SSIs above the background well 95% Chebyshev UPL, but Sen's slope estimator test did not show any increasing trend for zinc from all these wells.

99 Percent LCL (99%LCL) Compared to UPL of Background Well, 2L Standard, MCL or GWPS:

The calculated 99%LCL from the downgradient wells for the parameters has SSI is compared to the higher value of the groundwater standards (including 2L, MCL, GWPS, or UPL of background well). The 99%LCL for calcium and molybdenum are not used to compare with their respective background well PLs because standards for these parameters have not been established by EPA or the state. Therefore it is unknown whether the standards are required for these parameters. The 99% LCL above the standard are noted and listed below:

- Antimony: The 99%LCL for antimony from MW-8 is above the 2L standard (1 µg/L); but the results do not show any increasing trend based on time series plots and Sen's Slope estimator tests.

- **Barium:** The 99%LCL for barium from MW-8 is above the 2L standard (700 µg/L); but the results do not show any increasing trend based on time series plots and Sen's Slope estimator tests.

- **Chloride**: The 99%LCLs for chloride from MW-2, MW-3, and MW-8 are above the UPL of the background well (345.2 mg/L); but these results do not show any increasing trend based on time series plots and Sen's Slope estimator tests.

- **TDS**: The 99%LCLs for TDS from MW-2, MW-3, MW-7, and MW-8 are above the 95% UPPL of the background well; but these results do not show any increasing

trend except at MW-2 based on the time series plots and Sen's Slope estimator tests.

The remaining monitored parameters either are not detected, not above the MRL or are not statistically significant above the background concentration levels.

Literature Cited

USEPA, 2009. Unified Guidance - Statistical analysis of groundwater monitoring data at RCRA facilities. Office of Resource Conservation and Recovery Program Implementation and Information Division. EAP 530-R-09-007.

Attachments: Table 2 - Summary of Interwell Chemstat Statistics
Interwell Statistical Analysis Flow Chart
Output for Interwell Statistical Analysis and Time Series Plots

Table 2
Summary for Interwell Chemstat Statistics for Detected Groundwater Parameters Above the Method Reporting Limits
Charah Inc. Moncure Mine RD Structured Fill Site
Monitoring Event: July 2016

WELL ID	PARAMETER	UNITS	RESULT	MRL	Total Monitoring Events	Monitoring Events detected below MRL	Rosner's Outlier	Non-Det. Adjustment	Background Well PL		SSI	99% Confidence Interval	Sen's Slope	Standard Value (2L Std./MCL/ GWPS/PL)	99%LCL Exceeds Standard
									95% UPPL	Non-Parametric Prediction Limit (NPPL)					
MW-1	Antimony	ug/L	6.10	5	8	6	No	No		5	Yes	0.54-6.1		1*	No
MW-2	Antimony	ug/L	12.30	5	8	0	No	No		5	Yes	0.72-12.3	No Trend	1*	No
MW-3	Antimony	ug/L	11.40	5	8	0	No	No		5	Yes	0.44-12	No Trend	1*	No
MW-8	Antimony	ug/L	7.20	5	8	7	No	No		5	Yes	**1.1-10.1**	No Trend	1*	No
MW-1	Barium	ug/L	225	5	8	0	No	No	513.2		No			700*	No
MW-2	Barium	ug/L	220	5	8	0	No	No	513.2		No			700*	No
MW-3	Barium	ug/L	728	5	8	0	No	No	513.2		Yes	636-869	No Trend	700*	No
MW-4	Barium	ug/L	257	5	8	0	No	No	513.2		No			700*	No
MW-5	Barium	ug/L	93	5	8	0	No	No	513.2		No			700*	No
MW-6	Barium	ug/L	90	5	8	0	No	No	513.2		No			700*	No
MW-7	Barium	ug/L	224	5	8	0	No	No	513.2		No			700*	No
MW-8	Barium	ug/L	1,200	5	8	0	Yes	No	513.2		Yes	**1143-1479**	No Trend	700*	Yes
MW-1	Boron	ug/L	7.9	5	8	0	No	No	10.2		No			700*	No
MW-2	Boron	ug/L	39.4	5	8	0	No	No	10.2		Yes	32-47.9	No Trend	700*	No
MW-3	Boron	ug/L	41.9	5	8	0	No	No	10.2		Yes	37-47.4	No Trend	700*	No
MW-5	Boron	ug/L	9.8	5	8	0	No	No	10.2		No			700*	No
MW-6	Boron	ug/L	7.7	5	8	0	No	No	10.2		No			700*	No
MW-7	Boron	ug/L	22.7	5	8	0	No	No	10.2		Yes	17.7-80.2	Downward	700*	No
MW-8	Boron	ug/L	9.6	5	8	0	No	No	10.2		No			700*	No
MW-1	Calcium	ug/L	127,000	1000	8	0	No	No	42967		Yes	47,622-128,778	No Trend	NE	NA
MW-2	Calcium	ug/L	159,000	1000	8	0	No	No	42967		Yes	126,267-203,233	No Trend	NE	NA
MW-3	Calcium	ug/L	182,000	1000	8	0	No	No	42967		Yes	164,035-187,965	No Trend	NE	NA
MW-4	Calcium	ug/L	53,500	1000	8	0	No	No	42967		Yes	22,887-50,062	No Trend	NE	NA
MW-5	Calcium	ug/L	9,990	100	8	0	No	No	42967		No			NE	NA
MW-6	Calcium	ug/L	35,400	100	8	0	No	No	42967		No			NE	NA
MW-7	Calcium	ug/L	53,200	100	8	0	No	No	42967		Yes	37,129-51,220	Upward	NE	NA
MW-8	Calcium	ug/L	125,000	1000	8	0	No	No	42967		Yes	114,219-172,781	No Trend	NE	NA
MW-1	Chloride	mg/L	547	11	8	0	No	No	345.2		Yes	132-526	No Trend	345.2***	No
MW-2	Chloride	mg/L	1,160	16	8	0	No	No	345.2		Yes	**865-1,193**	No Trend	345.2***	Yes
MW-3	Chloride	mg/L	1,190	20	8	0	No	No	345.2		Yes	**1086-1294**	No Trend	345.2***	Yes
MW-4	Chloride	mg/L	423	16	8	0	No	No	345.2		Yes	146-389	No Trend	345.2***	No
MW-5	Chloride	mg/L	18	1	8	0	No	No	345.2		No			345.2***	No
MW-6	Chloride	mg/L	239	5	8	0	No	No	345.2		No			345.2***	No
MW-7	Chloride	mg/L	382	8	8	0	No	No	345.2		Yes	333-484	Downward	345.2***	No
MW-8	Chloride	mg/L	504	10	8	0	No	No	345.2		Yes	**429-805**	No Trend	345.2***	Yes
MW-2	Chromium	ug/L	5.20	5	8	1	No	No		5	Yes	5-23.3		10*	No
MW-1	Fluoride	mg/L	0.12	0.1	8	0	No	No	0.3		No			2*	No
MW-2	Fluoride	mg/L	0.14	0.1	8	0	No	ND=1/2DL	0.3		No			2*	No
MW-3	Fluoride	mg/L	0.26	0.1	8	0	No	ND=1/2DL	0.3		No			2*	No
MW-4	Fluoride	Fluoride	0.34	0.1	8	0	No	No	0.3		Yes	0.303-0.452	No Trend	2*	No
MW-5	Fluoride	mg/L	0.50	0.1	8	0	No	No	0.3		Yes	0.486-0.651	Downward	2*	No
MW-6	Fluoride	mg/L	0.31	0.1	8	0	No	No	0.3		Yes	0.272-0.485	No Trend	2*	No
MW-7	Fluoride	mg/L	0.21	0.1	8	0	No	No	0.3		No			2*	No
MW-1	Lithium	ug/L	32.8	0.5	8	0	No	No	52.5		No			52.5***	No
MW-2	Lithium	ug/L	356	0.5	8	0	Yes	ND=1/2DL	52.5		Yes	3.13-323	Upward	52.5***	No
MW-3	Lithium	ug/L	73.2	0.5	8	0	No	No	52.5		Yes	39.9-169	No Trend	52.5***	No

Table 2
Summary for Interwell Chemstat Statistics for Detected Groundwater Parameters Above the Method Reporting Limits
Charah Inc. Moncure Mine RD Structured Fill Site
Monitoring Event: July 2016

WELL ID	PARAMETER	UNITS	RESULT	MRL	Total Monitoring Events	Monitoring Events detected below MRL	Rosner's Outlier	Non-Det. Adjustment	Background Well PL		SSI	99% Confidence Interval	Sen's Slope	Standard Value (2L Std./MCL/ GWPS/PL)	99%LCL Exceeds Standard
									95% UPPL	Non-Parametric Prediction Limit (NPPL)					
MW-5	Lithium	ug/L	9.3	0.5	8	0	No	No	52.5		No			52.5***	No
MW-6	Lithium	ug/L	31.7	0.5	8	0	No	No	52.5		No			52.5***	No
MW-7	Lithium	ug/L	23.0	0.5	8	0	No	No	52.5		No			52.5***	No
MW-8	Lithium	ug/L	31.2	0.5	8	0	No	No	52.5		No			52.5***	No
MW-2	Molybdenum	ug/L	10.80	5	8	0	No	No		6.8	Yes	9.5-21.1		NE	NA
MW-3	Molybdenum	ug/L	12.00	5	8	0	No	No		6.8	Yes	8.6-21		NE	NA
MW-1	pH(Field)	S.U.	6.5		8	0	No	No	5.79-7.21[α]		No			6.5-8.5[ε]	NA
MW-2	pH(Field)	S.U.	8.5		8	0	No	No	5.79-7.21		Yes	7.53-8.16	No Trend	6.5-8.5[ε]	NA
MW-3	pH(Field)	S.U.	7.3		8	0	No	No	5.79-7.21		Yes	7.19-7.52	No Trend	6.5-8.5[ε]	NA
MW-4	pH(Field)	S.U.	6.3		8	0	No	No	5.79-7.21		No			6.5-8.5[ε]	NA
MW-5	pH(Field)	S.U.	6.8		8	0	No	No	5.79-7.21		No			6.5-8.5[ε]	NA
MW-6	pH(Field)	S.U.	6.4		8	0	No	No	5.79-7.21		No			6.5-8.5[ε]	NA
MW-7	pH(Field)	S.U.	6.8		8	0	No	No	5.79-7.21		No			6.5-8.5[ε]	NA
MW-8	pH(Field)	S.U.	6.9		8	0	No	No	5.79-7.21		No			6.5-8.5[ε]	NA
MW-1	Radium 226	pCi/L	0.448	0	8	0	No	No	1.38		No			5[ε]	No
MW-2	Radium 226	pCi/L	0.580	0	8	0	No	No	1.38		No			5[ε]	No
MW-3	Radium 226	pCi/L	0.308	0	8	0	No	No	1.38		No			5[ε]	No
MW-4	Radium 226	pCi/L	0.185	0	8	1	No	ND=1/2DL	1.38		No			5[ε]	No
MW-6	Radium 226	pCi/L	0.393	0	8	2	No	ND=1/2DL	1.38		No			5[ε]	No
MW-8	Radium 226	pCi/L	0.616	0	8	1	No	ND=1/2DL	1.38		No			5[ε]	No
MW-1	Radium 228	pCi/L	0.883	0	8	2	No	ND=1/2DL	2.08		No			5[ε]	No
MW-2	Radium 228	pCi/L	0.980	0	8	1	No	ND=1/2DL	2.08		No			5[ε]	No
MW-3	Radium 228	pCi/L	0.801	0	8	0	No	No	2.08		No			5[ε]	No
MW-4	Radium 228	pCi/L	0.455	0	8	1	No	ND=1/2DL	2.08		No			5[ε]	No
MW-5	Radium 228	pCi/L	0.568	0	8	2	No	ND=1/2DL	2.08		No			5[ε]	No
MW-6	Radium 228	pCi/L	0.907	0	8	1	No	ND=1/2DL	2.08		No			5[ε]	No
MW-7	Radium 228	pCi/L	0.019	0	8	1	No	ND=1/2DL	2.08		No			5[ε]	No
MW-8	Radium 228	pCi/L	0.548	0	8	1	No	ND=1/2DL	2.08		No			5[ε]	No
MW-1	Sulfate	mg/L	9.4	1	8	0	No	No	26.8		No			250*	No
MW-2	Sulfate	mg/L	205	16	8	0	Yes	No	26.8		Yes	140-257	No Trend	250*	No
MW-3	Sulfate	mg/L	125	20	8	0	No	No	26.8		Yes	0-69.8	No Trend	250*	No
MW-4	Sulfate	mg/L	9.2	16	8	0	No	No	26.8		No			250*	No
MW-5	Sulfate	mg/L	2.6	1	8	0	No	No	26.8		No			250*	No
MW-6	Sulfate	mg/L	53.8	1	8	0	No	No	26.8		Yes	35.6-177	No Trend	250*	No
MW-7	Sulfate	mg/L	11.2	1	8	0	No	No	26.8		No			250*	No
MW-8	Sulfate	mg/L	5.9	1	8	0	No	No	26.8		No			250*	No
MW-1	TDS	mg/L	1,410	125	8	0	No	No	723		Yes	425-1,283	No Trend	723***	No
MW-2	TDS	mg/L	3,290	250	8	0	No	No	723		Yes	**1,250-3,222**	Upward	723***	Yes
MW-3	TDS	mg/L	2,440	250	8	0	No	No	723		Yes	**1,332-3,177**	No Trend	723***	Yes
MW-4	TDS	mg/L	1,040	250	8	0	No	No	723		Yes	470-1022	No Trend	723***	No
MW-5	TDS	mg/L	221	25	8	0	No	No	723		No			723***	No
MW-6	TDS	mg/L	660	25	8	0	No	No	723		No			723***	No
MW-7	TDS	mg/L	1,100	125	8	0	No	No	723		Yes	**560-1,247**	No Trend	723***	Yes
MW-8	TDS	mg/L	1,340	125	8	0	No	No	723		Yes	**738-1,648**	No Trend	723***	Yes

Table 2
Summary for Interwell Chemstat Statistics for Detected Groundwater Parameters Above the Method Reporting Limits
Charah Inc. Moncure Mine RD Structured Fill Site
Monitoring Event: July 2016

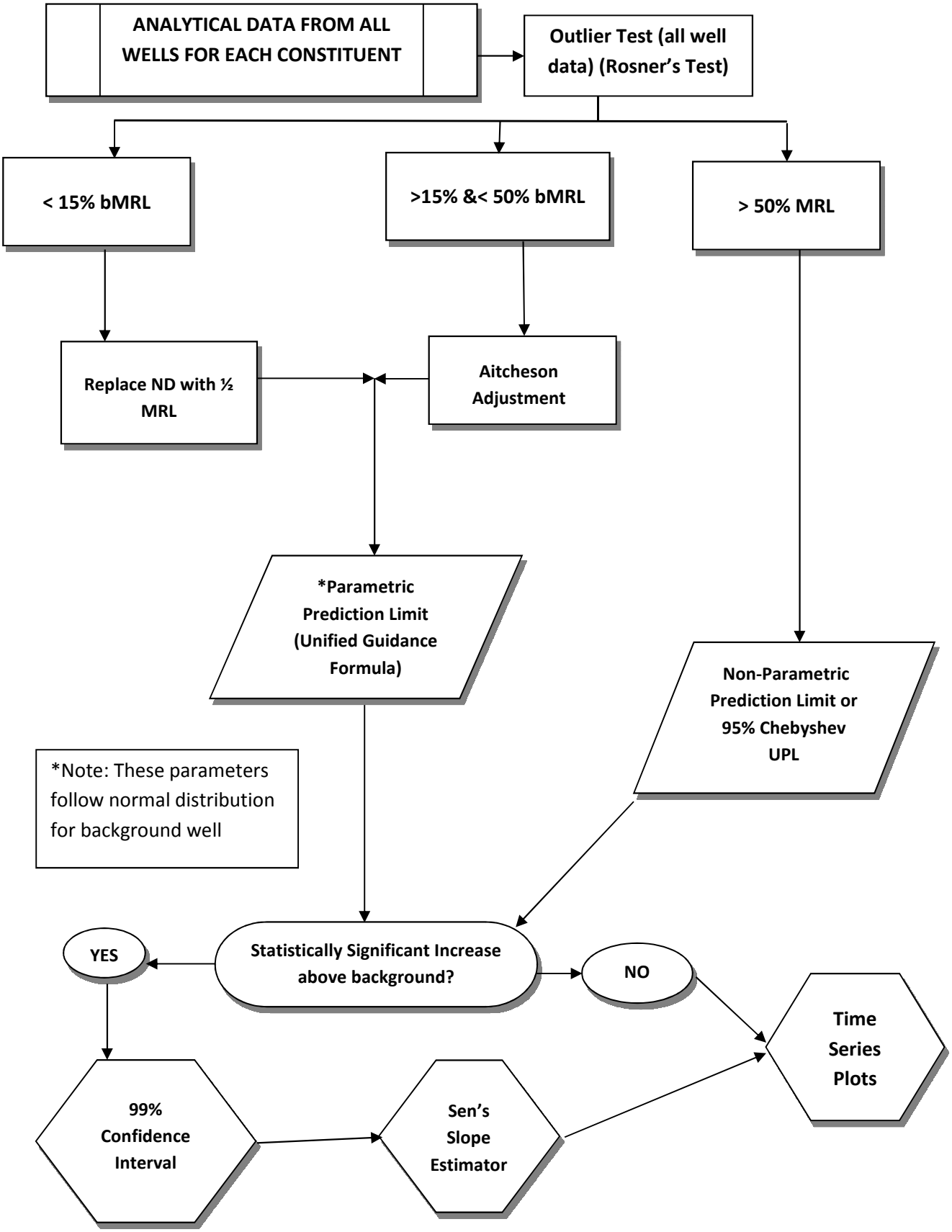
WELL ID	PARAMETER	UNITS	RESULT	MRL	Total Monitoring Events	Monitoring Events detected below MRL	Rosner's Outlier	Non-Det. Adjustment	Background Well PL		SSI	99% Confidence Interval	Sen's Slope	Standard Value (2L Std./MCL/ GWPS/PL)	99%LCL Exceeds Standard
									95% UPPL	Non-Parametric Prediction Limit (NPPL)					
MW-1	Zinc	ug/L	13.2	10	8	3	No	No		11.11	Yes	7-13.3	No Trend	1000*	No
MW-2	Zinc	ug/L	37.9	10	8	2	Yes	No		11.11	Yes	10-113	No Trend	1000*	No
MW-5	Zinc	ug/L	21.2	10	8	4	No	No		11.11	Yes	10-106	No Trend	1000*	No
MW-6	Zinc	ug/L	11.8	10	8	4	No	No		11.11	Yes	6-11.8	No Trend	1000*	No
MW-8	Zinc	ug/L	17.8	10	8	1	No	No		11.11	Yes	5.1-47.7	No Trend	1000*	No

Note: SSI = Statistically Significant Increase over the background data; Shaded cell indicates that the analysis for the parameter is not required;
%ND = Percentage of historic data not detected above the MRL; The NPPL for Zinc was tested using Chebyshev UPL (and the UPL for Zinc in the BG-1 is 11.11 ug/L);
* - 2L standard; ** - Groundwater Protection Standard; ***-Upper Prediction Limit for Background Well; ε - MCL combined standard for bRa-226 and Ra-228;
NE - Not Established; NA - Not Applicable;
$^{\alpha}$pH(Field) is tested with a 2-sided comparison of the same formula; MRL = Method Reporting Limit.

FLOW CHART 2

INTERWELL COMPARISON CALCULATION

METHODS FOR DETECTED GROUNDWATER PARAMETERS



Output of Interwell Statistics for Detected Groundwater Parameters

Concentrations (ug/L)

Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 37
Percent Non-Detects: 51.3889%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	7 (87.5%)	8/12/2015	0.55 J	0.55 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	6 (75%)	8/12/2015	0.54 J	0.54 J
			10/15/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/6/2016	ND<5 U	ND<5 U
			2/17/2016	ND<5 U	ND<5 U
			4/6/2016	ND<5 U	ND<5 U
			5/27/2016	ND<5 U	ND<5 U
			7/12/2016	6.1	6.1
MW-2	8	0 (0%)	8/12/2015	0.72 J	0.72 J
			10/15/2015	9.4	9.4
			11/19/2015	9.3	9.3
			1/6/2016	8.7	8.7
			2/17/2016	10.7	10.7
			4/6/2016	10.6	10.6
			5/27/2016	8.9	8.9
			7/12/2016	12.3	12.3
MW-3	8	0 (0%)	8/12/2015	0.44 J	0.44 J
			10/15/2015	12	12
			11/19/2015	10.1	10.1
			1/5/2016	9.2	9.2
			2/16/2016	10.8	10.8
			4/7/2016	8.7	8.7
			5/27/2016	10.7	10.7
			7/11/2016	11.4	11.4

MW-4	8	6 (75%)	8/12/2015	0.26 J	0.26 J
			10/15/2015	ND<5 U	ND<5 U
			11/19/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	5	5
			4/7/2016	ND<5 U	ND<5 U
			5/25/2016	ND<5 U	ND<5 U
			7/13/2016	ND<5 U	ND<5 U
MW-5	8	7 (87.5%)	8/12/2015	0.58 J	0.58 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/25/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-6	8	6 (75%)	8/12/2015	0.53 J	0.53 J
			10/19/2015	5.6	5.6
			11/20/2015	ND<5 U	ND<5 U
			1/5/2016	ND<5 U	ND<5 U
			2/17/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-7	8	5 (62.5%)	8/12/2015	0.63 J	0.63 J
			10/16/2015	5.9	5.9
			11/20/2015	ND<5 U	ND<5 U
			1/5/2016	ND<5 U	ND<5 U
			2/18/2016	ND<5 U	ND<5 U
			4/6/2016	5.5	5.5
			5/26/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-8	8	0 (0%)	8/12/2015	1.1	1.1
			10/15/2015	6.3	6.3
			11/20/2015	10.1	10.1
			1/6/2016	7.6	7.6
			2/18/2016	6.5	6.5
			4/6/2016	8.1	8.1
			5/26/2016	7.5	7.5
			7/12/2016	7.2	7.2

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Antimony

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 5.75764

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	7/12/2016	MW-2	12.3	6.54236
2	10/15/2015	MW-3	12	6.24236
3	7/11/2016	MW-3	11.4	5.64236
4	8/12/2015	MW-4	0.26 J	-5.49764
5	8/12/2015	MW-3	0.44 J	-5.31764
6	8/12/2015	MW-6	0.53 J	-5.22764
7	8/12/2015	MW-1	0.54 J	-5.21764
8	8/12/2015	BG-1	0.55 J	-5.20764
9	8/12/2015	MW-5	0.58 J	-5.17764
10	8/12/2015	MW-7	0.63 J	-5.12764

Iteration i = 9

Mean of 63 measurements = 5.96746
Std Dev = 2.22801
x(i+1) = 0.63 from measurement 8/12/2015 from location MW-7
Rosner Statistic R = |0.63 - 5.96746|/2.22801 = 2.39562
Lambda(72, 10, 0.05) = 3.22
2.39562 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 5.88328
Std Dev = 2.31057
x(i+1) = 0.58 from measurement 8/12/2015 from location MW-5
Rosner Statistic R = |0.58 - 5.88328|/2.31057 = 2.29523
Lambda(72, 9, 0.05) = 3.226
2.29523 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 5.80123
Std Dev = 2.38598
x(i+1) = 0.55 from measurement 8/12/2015 from location BG-1
Rosner Statistic R = |0.55 - 5.80123|/2.38598 = 2.20087
Lambda(72, 8, 0.05) = 3.232
2.20087 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 5.72152

Std Dev = 2.45453
x(i+1) = 0.54 from measurement 8/12/2015 from location MW-1
Rosner Statistic R = |0.54 - 5.72152|/2.45453 = 2.111
Lambda(72, 7, 0.05) = 3.238
2.111 < 3.238 -- No outliers detected for i = 6

Iteration i = 5

Mean of 67 measurements = 5.64403
Std Dev = 2.51708
x(i+1) = 0.53 from measurement 8/12/2015 from location MW-6
Rosner Statistic R = |0.53 - 5.64403|/2.51708 = 2.03173
Lambda(72, 6, 0.05) = 3.244
2.03173 < 3.244 -- No outliers detected for i = 5

Iteration i = 4

Mean of 68 measurements = 5.5675
Std Dev = 2.57671
x(i+1) = 0.44 from measurement 8/12/2015 from location MW-3
Rosner Statistic R = |0.44 - 5.5675|/2.57671 = 1.98994
Lambda(72, 5, 0.05) = 3.25
1.98994 < 3.25 -- No outliers detected for i = 4

Iteration i = 3

Mean of 69 measurements = 5.49058
Std Dev = 2.63629
x(i+1) = 0.26 from measurement 8/12/2015 from location MW-4
Rosner Statistic R = |0.26 - 5.49058|/2.63629 = 1.98407
Lambda(72, 4, 0.05) = 3.25
1.98407 < 3.25 -- No outliers detected for i = 3

Iteration i = 2

Mean of 70 measurements = 5.575
Std Dev = 2.71075
x(i+1) = 11.4 from measurement 7/11/2016 from location MW-3
Rosner Statistic R = |11.4 - 5.575|/2.71075 = 2.14885
Lambda(72, 3, 0.05) = 3.26
2.14885 < 3.26 -- No outliers detected for i = 2

Iteration i = 1

Mean of 71 measurements = 5.66549
Std Dev = 2.79725
x(i+1) = 12 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |12 - 5.66549|/2.79725 = 2.26455
Lambda(72, 2, 0.05) = 3.26
2.26455 < 3.26 -- No outliers detected for i = 1

Iteration i = 0

Mean of 72 measurements = 5.75764
Std Dev = 2.88544
x(i+1) = 12.3 from measurement 7/12/2016 from location MW-2
Rosner Statistic R = |12.3 - 5.75764|/2.88544 = 2.26737
Lambda(72, 1, 0.05) = 3.27
2.26737 < 3.27 -- No outliers detected for i = 0

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Antimony

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 51.3889%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	**7/12/2016**	**1**	**6.1**	**TRUE**
MW-2	**7/12/2016**	**1**	**12.3**	**TRUE**
MW-3	**7/11/2016**	**1**	**11.4**	**TRUE**
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	**7/12/2016**	**1**	**7.2**	**TRUE**

Non-Parametric Confidence Interval

Parameter: Antimony
Well: MW-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-1	8/12/2015	0.54 J	1
MW-1	10/15/2015	ND<5 U	4.5
MW-1	11/20/2015	ND<5 U	4.5
MW-1	1/6/2016	ND<5 U	4.5
MW-1	2/17/2016	ND<5 U	4.5
MW-1	4/6/2016	ND<5 U	4.5
MW-1	5/27/2016	ND<5 U	4.5
MW-1	7/12/2016	6.1	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 6.1
Lower Confidence Inverval X(1) = 0.54
0.54 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Antimony
Well: MW-2
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-2	8/12/2015	0.72 J	1
MW-2	1/6/2016	8.7	2
MW-2	5/27/2016	8.9	3
MW-2	11/19/2015	9.3	4
MW-2	10/15/2015	9.4	5
MW-2	4/6/2016	10.6	6
MW-2	2/17/2016	10.7	7
MW-2	7/12/2016	12.3	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 12.3
Lower Confidence Inverval X(1) = 0.72
0.72 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Antimony
Well: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-3	8/12/2015	0.44 J	1
MW-3	4/7/2016	8.7	2
MW-3	1/5/2016	9.2	3
MW-3	11/19/2015	10.1	4
MW-3	5/27/2016	10.7	5
MW-3	2/16/2016	10.8	6
MW-3	7/11/2016	11.4	7
MW-3	10/15/2015	12	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 12
Lower Confidence Inverval X(1) = 0.44
0.44 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Antimony
Well: MW-8
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-8	8/12/2015	1.1	1
MW-8	10/15/2015	6.3	2
MW-8	2/18/2016	6.5	3
MW-8	7/12/2016	7.2	4
MW-8	5/26/2016	7.5	5
MW-8	1/6/2016	7.6	6
MW-8	4/6/2016	8.1	7
MW-8	11/20/2015	10.1	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 10.1
Lower Confidence Inverval X(1) = 1.1
1.1 > 0 Indicating Statistical Significance

Sen's Slope Analysis

Parameter: Antimony
Location: MW-2

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
9.4 (10/15/2015)	0.72 J (8/12/2015)	(9.4 - 0.72)/(2 - 1)	8.68
9.3 (11/19/2015)	0.72 J (8/12/2015)	(9.3 - 0.72)/(3 - 1)	4.29
8.7 (1/6/2016)	0.72 J (8/12/2015)	(8.7 - 0.72)/(4 - 1)	2.66
10.7 (2/17/2016)	0.72 J (8/12/2015)	(10.7 - 0.72)/(5 - 1)	2.495
10.6 (4/6/2016)	0.72 J (8/12/2015)	(10.6 - 0.72)/(6 - 1)	1.976
8.9 (5/27/2016)	0.72 J (8/12/2015)	(8.9 - 0.72)/(7 - 1)	1.36333
12.3 (7/12/2016)	0.72 J (8/12/2015)	(12.3 - 0.72)/(8 - 1)	1.65429
9.3 (11/19/2015)	9.4 (10/15/2015)	(9.3 - 9.4)/(3 - 2)	-0.1
8.7 (1/6/2016)	9.4 (10/15/2015)	(8.7 - 9.4)/(4 - 2)	-0.35
10.7 (2/17/2016)	9.4 (10/15/2015)	(10.7 - 9.4)/(5 - 2)	0.433333
10.6 (4/6/2016)	9.4 (10/15/2015)	(10.6 - 9.4)/(6 - 2)	0.3
8.9 (5/27/2016)	9.4 (10/15/2015)	(8.9 - 9.4)/(7 - 2)	-0.1
12.3 (7/12/2016)	9.4 (10/15/2015)	(12.3 - 9.4)/(8 - 2)	0.483333
8.7 (1/6/2016)	9.3 (11/19/2015)	(8.7 - 9.3)/(4 - 3)	-0.6
10.7 (2/17/2016)	9.3 (11/19/2015)	(10.7 - 9.3)/(5 - 3)	0.7
10.6 (4/6/2016)	9.3 (11/19/2015)	(10.6 - 9.3)/(6 - 3)	0.433333
8.9 (5/27/2016)	9.3 (11/19/2015)	(8.9 - 9.3)/(7 - 3)	-0.1
12.3 (7/12/2016)	9.3 (11/19/2015)	(12.3 - 9.3)/(8 - 3)	0.6
10.7 (2/17/2016)	8.7 (1/6/2016)	(10.7 - 8.7)/(5 - 4)	2
10.6 (4/6/2016)	8.7 (1/6/2016)	(10.6 - 8.7)/(6 - 4)	0.95
8.9 (5/27/2016)	8.7 (1/6/2016)	(8.9 - 8.7)/(7 - 4)	0.0666667
12.3 (7/12/2016)	8.7 (1/6/2016)	(12.3 - 8.7)/(8 - 4)	0.9
10.6 (4/6/2016)	10.7 (2/17/2016)	(10.6 - 10.7)/(6 - 5)	-0.1
8.9 (5/27/2016)	10.7 (2/17/2016)	(8.9 - 10.7)/(7 - 5)	-0.9
12.3 (7/12/2016)	10.7 (2/17/2016)	(12.3 - 10.7)/(8 - 5)	0.533333
8.9 (5/27/2016)	10.6 (4/6/2016)	(8.9 - 10.6)/(7 - 6)	-1.7
12.3 (7/12/2016)	10.6 (4/6/2016)	(12.3 - 10.6)/(8 - 6)	0.85
12.3 (7/12/2016)	8.9 (5/27/2016)	(12.3 - 8.9)/(8 - 7)	3.4

Number of Q values = 28

Ordered Q Values

n	Q
1	-1.7
2	-0.9

3	-0.6
4	-0.35
5	-0.1
6	-0.1
7	-0.1
8	-0.1
9	0.0666667
10	0.3
11	0.433333
12	0.433333
13	0.483333
14	0.533333
15	0.6
16	0.7
17	0.85
18	0.9
19	0.95
20	1.36333
21	1.65429
22	1.976
23	2
24	2.495
25	2.66
26	3.4
27	4.29
28	8.68

Sen's Estimator (Median Q) is 0.566667

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.1 = Q(7)
Upper limit is 1.976 = Q(22)
-0.1 < 0 < 1.976 indicating no trend in data.

Sen's Slope Analysis

Parameter: Antimony
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
12 (10/15/2015)	0.44 J (8/12/2015)	(12 - 0.44)/(2 - 1)	11.56
10.1 (11/19/2015)	0.44 J (8/12/2015)	(10.1 - 0.44)/(3 - 1)	4.83
9.2 (1/5/2016)	0.44 J (8/12/2015)	(9.2 - 0.44)/(4 - 1)	2.92
10.8 (2/16/2016)	0.44 J (8/12/2015)	(10.8 - 0.44)/(5 - 1)	2.59
8.7 (4/7/2016)	0.44 J (8/12/2015)	(8.7 - 0.44)/(6 - 1)	1.652
10.7 (5/27/2016)	0.44 J (8/12/2015)	(10.7 - 0.44)/(7 - 1)	1.71
11.4 (7/11/2016)	0.44 J (8/12/2015)	(11.4 - 0.44)/(8 - 1)	1.56571
10.1 (11/19/2015)	12 (10/15/2015)	(10.1 - 12)/(3 - 2)	-1.9
9.2 (1/5/2016)	12 (10/15/2015)	(9.2 - 12)/(4 - 2)	-1.4
10.8 (2/16/2016)	12 (10/15/2015)	(10.8 - 12)/(5 - 2)	-0.4
8.7 (4/7/2016)	12 (10/15/2015)	(8.7 - 12)/(6 - 2)	-0.825
10.7 (5/27/2016)	12 (10/15/2015)	(10.7 - 12)/(7 - 2)	-0.26
11.4 (7/11/2016)	12 (10/15/2015)	(11.4 - 12)/(8 - 2)	-0.1
9.2 (1/5/2016)	10.1 (11/19/2015)	(9.2 - 10.1)/(4 - 3)	-0.9
10.8 (2/16/2016)	10.1 (11/19/2015)	(10.8 - 10.1)/(5 - 3)	0.35
8.7 (4/7/2016)	10.1 (11/19/2015)	(8.7 - 10.1)/(6 - 3)	-0.466667
10.7 (5/27/2016)	10.1 (11/19/2015)	(10.7 - 10.1)/(7 - 3)	0.15
11.4 (7/11/2016)	10.1 (11/19/2015)	(11.4 - 10.1)/(8 - 3)	0.26
10.8 (2/16/2016)	9.2 (1/5/2016)	(10.8 - 9.2)/(5 - 4)	1.6
8.7 (4/7/2016)	9.2 (1/5/2016)	(8.7 - 9.2)/(6 - 4)	-0.25
10.7 (5/27/2016)	9.2 (1/5/2016)	(10.7 - 9.2)/(7 - 4)	0.5
11.4 (7/11/2016)	9.2 (1/5/2016)	(11.4 - 9.2)/(8 - 4)	0.55
8.7 (4/7/2016)	10.8 (2/16/2016)	(8.7 - 10.8)/(6 - 5)	-2.1
10.7 (5/27/2016)	10.8 (2/16/2016)	(10.7 - 10.8)/(7 - 5)	-0.05
11.4 (7/11/2016)	10.8 (2/16/2016)	(11.4 - 10.8)/(8 - 5)	0.2
10.7 (5/27/2016)	8.7 (4/7/2016)	(10.7 - 8.7)/(7 - 6)	2
11.4 (7/11/2016)	8.7 (4/7/2016)	(11.4 - 8.7)/(8 - 6)	1.35
11.4 (7/11/2016)	10.7 (5/27/2016)	(11.4 - 10.7)/(8 - 7)	0.7

Number of Q values = 28

Ordered Q Values

n	Q
1	-2.1
2	-1.9

3	-1.4
4	-0.9
5	-0.825
6	-0.466667
7	-0.4
8	-0.26
9	-0.25
10	-0.1
11	-0.05
12	0.15
13	0.2
14	0.26
15	0.35
16	0.5
17	0.55
18	0.7
19	1.35
20	1.56571
21	1.6
22	1.652
23	1.71
24	2
25	2.59
26	2.92
27	4.83
28	11.56

Sen's Estimator (Median Q) is 0.305

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.4 = Q(7)
Upper limit is 1.652 = Q(22)
-0.4 < 0 < 1.652 indicating no trend in data.

Sen's Slope Analysis

Parameter: Antimony
Location: MW-8

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.3 (10/15/2015)	1.1 (8/12/2015)	(6.3 - 1.1)/(2 - 1)	5.2
10.1 (11/20/2015)	1.1 (8/12/2015)	(10.1 - 1.1)/(3 - 1)	4.5
7.6 (1/6/2016)	1.1 (8/12/2015)	(7.6 - 1.1)/(4 - 1)	2.16667
6.5 (2/18/2016)	1.1 (8/12/2015)	(6.5 - 1.1)/(5 - 1)	1.35
8.1 (4/6/2016)	1.1 (8/12/2015)	(8.1 - 1.1)/(6 - 1)	1.4
7.5 (5/26/2016)	1.1 (8/12/2015)	(7.5 - 1.1)/(7 - 1)	1.06667
7.2 (7/12/2016)	1.1 (8/12/2015)	(7.2 - 1.1)/(8 - 1)	0.871429
10.1 (11/20/2015)	6.3 (10/15/2015)	(10.1 - 6.3)/(3 - 2)	3.8
7.6 (1/6/2016)	6.3 (10/15/2015)	(7.6 - 6.3)/(4 - 2)	0.65
6.5 (2/18/2016)	6.3 (10/15/2015)	(6.5 - 6.3)/(5 - 2)	0.0666667
8.1 (4/6/2016)	6.3 (10/15/2015)	(8.1 - 6.3)/(6 - 2)	0.45
7.5 (5/26/2016)	6.3 (10/15/2015)	(7.5 - 6.3)/(7 - 2)	0.24
7.2 (7/12/2016)	6.3 (10/15/2015)	(7.2 - 6.3)/(8 - 2)	0.15
7.6 (1/6/2016)	10.1 (11/20/2015)	(7.6 - 10.1)/(4 - 3)	-2.5
6.5 (2/18/2016)	10.1 (11/20/2015)	(6.5 - 10.1)/(5 - 3)	-1.8
8.1 (4/6/2016)	10.1 (11/20/2015)	(8.1 - 10.1)/(6 - 3)	-0.666667
7.5 (5/26/2016)	10.1 (11/20/2015)	(7.5 - 10.1)/(7 - 3)	-0.65
7.2 (7/12/2016)	10.1 (11/20/2015)	(7.2 - 10.1)/(8 - 3)	-0.58
6.5 (2/18/2016)	7.6 (1/6/2016)	(6.5 - 7.6)/(5 - 4)	-1.1
8.1 (4/6/2016)	7.6 (1/6/2016)	(8.1 - 7.6)/(6 - 4)	0.25
7.5 (5/26/2016)	7.6 (1/6/2016)	(7.5 - 7.6)/(7 - 4)	-0.0333333
7.2 (7/12/2016)	7.6 (1/6/2016)	(7.2 - 7.6)/(8 - 4)	-0.1
8.1 (4/6/2016)	6.5 (2/18/2016)	(8.1 - 6.5)/(6 - 5)	1.6
7.5 (5/26/2016)	6.5 (2/18/2016)	(7.5 - 6.5)/(7 - 5)	0.5
7.2 (7/12/2016)	6.5 (2/18/2016)	(7.2 - 6.5)/(8 - 5)	0.233333
7.5 (5/26/2016)	8.1 (4/6/2016)	(7.5 - 8.1)/(7 - 6)	-0.6
7.2 (7/12/2016)	8.1 (4/6/2016)	(7.2 - 8.1)/(8 - 6)	-0.45
7.2 (7/12/2016)	7.5 (5/26/2016)	(7.2 - 7.5)/(8 - 7)	-0.3

Number of Q values = 28

Ordered Q Values

n	Q
1	-2.5
2	-1.8

3	-1.1
4	-0.666667
5	-0.65
6	-0.6
7	-0.58
8	-0.45
9	-0.3
10	-0.1
11	-0.0333333
12	0.0666667
13	0.15
14	0.233333
15	0.24
16	0.25
17	0.45
18	0.5
19	0.65
20	0.871429
21	1.06667
22	1.35
23	1.4
24	1.6
25	2.16667
26	3.8
27	4.5
28	5.2

Sen's Estimator (Median Q) is 0.236667

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/12/2016	1

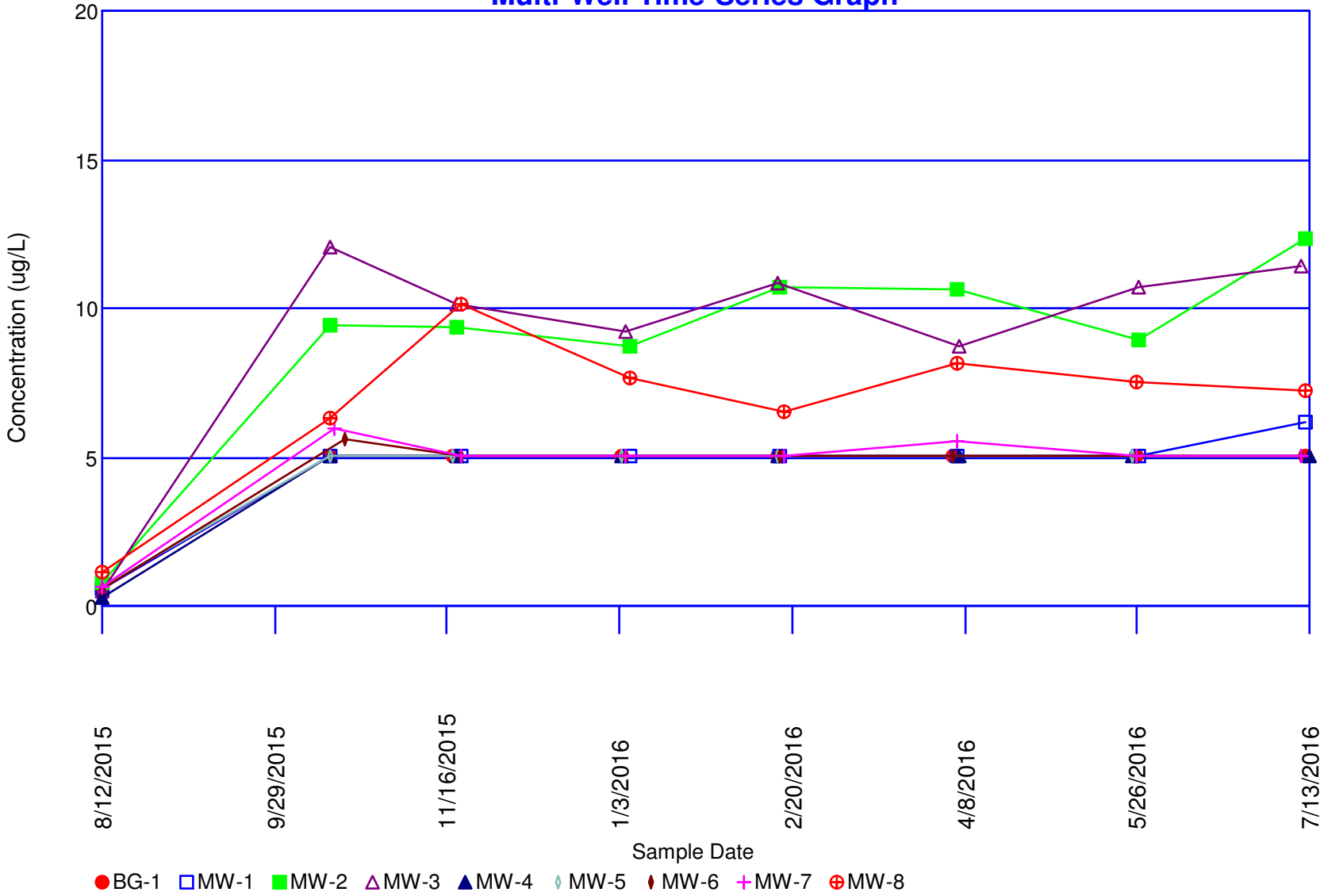
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.58 = Q(7)
Upper limit is 1.35 = Q(22)
-0.58 < 0 < 1.35 indicating no trend in data.

Antimony

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 71
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	380	380
			10/15/2015	443	443
			11/18/2015	344	344
			1/4/2016	310	310
			2/16/2016	354	354
			4/5/2016	302	302
			5/26/2016	330	330
			7/12/2016	363	363

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	230	230
			10/15/2015	117	117
			11/20/2015	153	153
			1/6/2016	220	220
			2/17/2016	70.3	70.3
			4/6/2016	129	129
			5/27/2016	121	121
			7/12/2016	225	225
MW-2	8	0 (0%)	8/12/2015	270	270
			10/15/2015	372	372
			11/19/2015	306	306
			1/6/2016	262	262
			2/17/2016	318	318
			4/6/2016	230	230
			5/27/2016	197	197
			7/12/2016	220	220
MW-4	8	0 (0%)	8/12/2015	390	390
			10/15/2015	232	232
			11/19/2015	191	191
			1/4/2016	176	176
			2/16/2016	157	157
			4/7/2016	85.9	85.9
			5/25/2016	90.5	90.5
			7/13/2016	257	257

MW-5	8	0 (0%)	8/12/2015	160	160
			10/15/2015	306	306
			11/18/2015	93.2	93.2
			1/4/2016	102	102
			2/16/2016	129	129
			4/5/2016	91.4	91.4
			5/25/2016	100	100
			7/11/2016	93	93
MW-6	8	0 (0%)	8/12/2015	110	110
			10/19/2015	117	117
			11/20/2015	142	142
			1/5/2016	140	140
			2/17/2016	118	118
			4/5/2016	108	108
			5/26/2016	88.3	88.3
			7/11/2016	89.8	89.8
MW-7	8	0 (0%)	8/12/2015	290	290
			10/16/2015	237	237
			11/20/2015	364	364
			1/5/2016	269	269
			2/18/2016	254	254
			4/6/2016	208	208
			5/26/2016	222	222
			7/11/2016	224	224
MW-8	8	0 (0%)	8/12/2015	1100	1100
			10/15/2015	1240	1240
			11/20/2015	1550	1550
			1/6/2016	1430	1430
			2/18/2016	1490	1490
			4/6/2016	1220	1220
			5/26/2016	1260	1260
			7/12/2016	1200	1200
MW-3	7	0 (0%)	10/15/2015	860	860
			11/19/2015	718	718
			1/5/2016	802	802
			2/16/2016	855	855
			4/7/2016	578	578
			5/27/2016	728	728
			7/11/2016	728	728

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Barium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 389.583

10 most extreme of 71 measurements

by order of magnitude difference from the mean

1	11/20/2015	MW-8	1550	1160.42
2	2/18/2016	MW-8	1490	1100.42
3	1/6/2016	MW-8	1430	1040.42
4	5/26/2016	MW-8	1260	870.417
5	10/15/2015	MW-8	1240	850.417
6	4/6/2016	MW-8	1220	830.417
7	7/12/2016	MW-8	1200	810.417
8	8/12/2015	MW-8	1100	710.417
9	10/15/2015	MW-3	860	470.417
10	2/16/2016	MW-3	855	465.417

Iteration i = 9

Mean of 62 measurements = 263.071
Std Dev = 184.049
x(i+1) = 855 from measurement 2/16/2016 from location MW-3
Rosner Statistic R = |855 - 263.071|/184.049 = 3.21615
Lambda(71, 10, 0.05) = 3.215
3.21615 > 3.215 -- Measurement 2/16/2016 for location MW-3 is an outlier

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Iteration i = 8

Mean of 63 measurements = 272.546
Std Dev = 197.443
x(i+1) = 860 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |860 - 272.546|/197.443 = 2.97531
Lambda(71, 9, 0.05) = 3.221
Measurement 10/15/2015 for location MW-3 is an outlier

Iteration i = 7

Mean of 64 measurements = 285.475
Std Dev = 221.502
x(i+1) = 1100 from measurement 8/12/2015 from location MW-8
Rosner Statistic R = |1100 - 285.475|/221.502 = 3.67729
Lambda(71, 8, 0.05) = 3.227
Measurement 8/12/2015 for location MW-8 is an outlier

Iteration i = 6

Mean of 65 measurements = 299.545

Std Dev = 247.312
x(i+1) = 1200 from measurement 7/12/2016 from location MW-8
Rosner Statistic R = |1200 - 299.545|/247.312 = 3.64096
Lambda(71, 7, 0.05) = 3.233
Measurement 7/12/2016 for location MW-8 is an outlier

Iteration i = 5

Mean of 66 measurements = 313.491
Std Dev = 270.295
x(i+1) = 1220 from measurement 4/6/2016 from location MW-8
Rosner Statistic R = |1220 - 313.491|/270.295 = 3.35378
Lambda(71, 6, 0.05) = 3.239
Measurement 4/6/2016 for location MW-8 is an outlier

Iteration i = 4

Mean of 67 measurements = 327.319
Std Dev = 291.144
x(i+1) = 1240 from measurement 10/15/2015 from location MW-8
Rosner Statistic R = |1240 - 327.319|/291.144 = 3.13481
Lambda(71, 5, 0.05) = 3.245
Measurement 10/15/2015 for location MW-8 is an outlier

Iteration i = 3

Mean of 68 measurements = 341.035
Std Dev = 310.31
x(i+1) = 1260 from measurement 5/26/2016 from location MW-8
Rosner Statistic R = |1260 - 341.035|/310.31 = 2.96145
Lambda(71, 4, 0.05) = 3.245
Measurement 5/26/2016 for location MW-8 is an outlier

Iteration i = 2

Mean of 69 measurements = 356.817
Std Dev = 334.757
x(i+1) = 1430 from measurement 1/6/2016 from location MW-8
Rosner Statistic R = |1430 - 356.817|/334.757 = 3.20586
Lambda(71, 3, 0.05) = 3.255
Measurement 1/6/2016 for location MW-8 is an outlier

Iteration i = 1

Mean of 70 measurements = 373.006
Std Dev = 358.863
x(i+1) = 1490 from measurement 2/18/2016 from location MW-8
Rosner Statistic R = |1490 - 373.006|/358.863 = 3.1126
Lambda(71, 2, 0.05) = 3.255
Measurement 2/18/2016 for location MW-8 is an outlier

Iteration i = 0

Mean of 71 measurements = 389.583

Std Dev = 382.693

x(i+1) = 1550 from measurement 11/20/2015 from location MW-8

Rosner Statistic R = |1550 - 389.583|/382.693 = 3.03224

Lambda(71, 1, 0.05) = 3.265

Measurement 11/20/2015 for location MW-8 is an outlier

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 353.25
Background Std Dev = 44.7046

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	225	[0, 513.237]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	220	[0, 513.237]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**728**	**[0, 513.237]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	257	[0, 513.237]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	93	[0, 513.237]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	89.8	[0, 513.237]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	224	[0, 513.237]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**1200**	**[0, 513.237]**	**TRUE**

Confidence Interval

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	353.25
Std Dev	44.7046
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[305.866, 400.634]	353.25	TRUE
95%	1.89458	[323.305, 383.195]	353.25	TRUE

Compliance Locations

Location	**MW-1**
Mean	158.162
Std Dev	59.9095
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[94.6623, 221.663]	158.162	TRUE
95%	1.89458	[118.033, 198.292]	158.162	TRUE

Location	**MW-2**
Mean	271.875
Std Dev	57.9025
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[210.502, 333.248]	271.875	TRUE
95%	1.89458	[233.09, 310.66]	271.875	TRUE

Location	**MW-3**
Mean	752.714
Std Dev	97.7697
Degrees of Freedom	6
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[636.582, 868.847]	752.714	TRUE
95%	1.94318	[680.907, 824.522]	752.714	TRUE

Location	**MW-4**
Mean	197.425
Std Dev	98.4414
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[93.0835, 301.767]	197.425	TRUE
95%	1.89458	[131.486, 263.364]	197.425	TRUE

Location	**MW-5**
Mean	134.325
Std Dev	73.314
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[56.617, 212.033]	134.325	TRUE
95%	1.89458	[85.2168, 183.433]	134.325	TRUE

Location	**MW-6**
Mean	114.137
Std Dev	19.9391
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[93.0033, 135.272]	114.137	TRUE
95%	1.89458	[100.782, 127.493]	114.137	TRUE

Location	**MW-7**
Mean	258.5
Std Dev	50.4097
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[205.069, 311.931]	258.5	TRUE
95%	1.89458	[224.734, 292.266]	258.5	TRUE

Location	**MW-8**
Mean	1311.25
Std Dev	158.604
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[1143.14, 1479.36]	1311.25	TRUE
95%	1.89458	[1205.01, 1417.49]	1311.25	TRUE

Sen's Slope Analysis

Parameter: Barium

Location: MW-3

Natural Logarithm Transformation

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.57647 (11/19/2015)	6.75693 (10/15/2015)	(6.57647 - 6.75693)/(2 - 1)	-0.180463
6.68711 (1/5/2016)	6.75693 (10/15/2015)	(6.68711 - 6.75693)/(3 - 1)	-0.0349119
6.7511 (2/16/2016)	6.75693 (10/15/2015)	(6.7511 - 6.75693)/(4 - 1)	-0.00194364
6.35957 (4/7/2016)	6.75693 (10/15/2015)	(6.35957 - 6.75693)/(5 - 1)	-0.0993396
6.5903 (5/27/2016)	6.75693 (10/15/2015)	(6.5903 - 6.75693)/(6 - 1)	-0.0333263
6.5903 (7/11/2016)	6.75693 (10/15/2015)	(6.5903 - 6.75693)/(7 - 1)	-0.0277719
6.68711 (1/5/2016)	6.57647 (11/19/2015)	(6.68711 - 6.57647)/(3 - 2)	0.110639
6.7511 (2/16/2016)	6.57647 (11/19/2015)	(6.7511 - 6.57647)/(4 - 2)	0.0873159
6.35957 (4/7/2016)	6.57647 (11/19/2015)	(6.35957 - 6.57647)/(5 - 2)	-0.0722986
6.5903 (5/27/2016)	6.57647 (11/19/2015)	(6.5903 - 6.57647)/(6 - 2)	0.00345787
6.5903 (7/11/2016)	6.57647 (11/19/2015)	(6.5903 - 6.57647)/(7 - 2)	0.0027663
6.7511 (2/16/2016)	6.68711 (1/5/2016)	(6.7511 - 6.68711)/(4 - 3)	0.0639929
6.35957 (4/7/2016)	6.68711 (1/5/2016)	(6.35957 - 6.68711)/(5 - 3)	-0.163767
6.5903 (5/27/2016)	6.68711 (1/5/2016)	(6.5903 - 6.68711)/(6 - 3)	-0.0322692
6.5903 (7/11/2016)	6.68711 (1/5/2016)	(6.5903 - 6.68711)/(7 - 3)	-0.0242019
6.35957 (4/7/2016)	6.7511 (2/16/2016)	(6.35957 - 6.7511)/(5 - 4)	-0.391528
6.5903 (5/27/2016)	6.7511 (2/16/2016)	(6.5903 - 6.7511)/(6 - 4)	-0.0804002
6.5903 (7/11/2016)	6.7511 (2/16/2016)	(6.5903 - 6.7511)/(7 - 4)	-0.0536001
6.5903 (5/27/2016)	6.35957 (4/7/2016)	(6.5903 - 6.35957)/(6 - 5)	0.230727
6.5903 (7/11/2016)	6.35957 (4/7/2016)	(6.5903 - 6.35957)/(7 - 5)	0.115364
6.5903 (7/11/2016)	6.5903 (5/27/2016)	(6.5903 - 6.5903)/(7 - 6)	0

Number of Q values = 21

Ordered Q Values

n	Q
1	-0.391528
2	-0.180463
3	-0.163767
4	-0.0993396
5	-0.0804002
6	-0.0722986
7	-0.0536001
8	-0.0349119
9	-0.0333263
10	-0.0322692

11	-0.0277719
12	-0.0242019
13	-0.00194364
14	0
15	0.0027663
16	0.00345787
17	0.0639929
18	0.0873159
19	0.110639
20	0.115364
21	0.230727

Sen's Estimator (Median Q) is -0.0277719

Tied Group	Value	Members
1	6.5903	2

Time Period	Observations
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 798
b = 1890
c = 84
Group Variance = 43.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.8277
M1 = (21 - 10.8277)/2.0 = 5.08613
M2 = (21 + 10.8277)/2.0 + 1 = 16.9139
Lower limit is -0.0804002 = Q(5)
Upper limit is 0.0639929 = Q(17)
-0.0804002 < 0 < 0.0639929 indicating no trend in data.

Sen's Slope Analysis

Parameter: Barium
Location: MW-8

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.12287 (10/15/2015)	7.00307 (8/12/2015)	(7.12287 - 7.00307)/(2 - 1)	0.119801
7.34601 (11/20/2015)	7.00307 (8/12/2015)	(7.34601 - 7.00307)/(3 - 1)	0.171472
7.26543 (1/6/2016)	7.00307 (8/12/2015)	(7.26543 - 7.00307)/(4 - 1)	0.0874548
7.30653 (2/18/2016)	7.00307 (8/12/2015)	(7.30653 - 7.00307)/(5 - 1)	0.0758665
7.10661 (4/6/2016)	7.00307 (8/12/2015)	(7.10661 - 7.00307)/(6 - 1)	0.0207081
7.13887 (5/26/2016)	7.00307 (8/12/2015)	(7.13887 - 7.00307)/(7 - 1)	0.0226336
7.09008 (7/12/2016)	7.00307 (8/12/2015)	(7.09008 - 7.00307)/(8 - 1)	0.0124302
7.34601 (11/20/2015)	7.12287 (10/15/2015)	(7.34601 - 7.12287)/(3 - 2)	0.223144
7.26543 (1/6/2016)	7.12287 (10/15/2015)	(7.26543 - 7.12287)/(4 - 2)	0.0712815
7.30653 (2/18/2016)	7.12287 (10/15/2015)	(7.30653 - 7.12287)/(5 - 2)	0.0612216
7.10661 (4/6/2016)	7.12287 (10/15/2015)	(7.10661 - 7.12287)/(6 - 2)	-0.00406513
7.13887 (5/26/2016)	7.12287 (10/15/2015)	(7.13887 - 7.12287)/(7 - 2)	0.00320007
7.09008 (7/12/2016)	7.12287 (10/15/2015)	(7.09008 - 7.12287)/(8 - 2)	-0.00546497
7.26543 (1/6/2016)	7.34601 (11/20/2015)	(7.26543 - 7.34601)/(4 - 3)	-0.0805805
7.30653 (2/18/2016)	7.34601 (11/20/2015)	(7.30653 - 7.34601)/(5 - 3)	-0.0197394
7.10661 (4/6/2016)	7.34601 (11/20/2015)	(7.10661 - 7.34601)/(6 - 3)	-0.0798014
7.13887 (5/26/2016)	7.34601 (11/20/2015)	(7.13887 - 7.34601)/(7 - 3)	-0.0517858
7.09008 (7/12/2016)	7.34601 (11/20/2015)	(7.09008 - 7.34601)/(8 - 3)	-0.0511867
7.30653 (2/18/2016)	7.26543 (1/6/2016)	(7.30653 - 7.26543)/(5 - 4)	0.0411017
7.10661 (4/6/2016)	7.26543 (1/6/2016)	(7.10661 - 7.26543)/(6 - 4)	-0.0794118
7.13887 (5/26/2016)	7.26543 (1/6/2016)	(7.13887 - 7.26543)/(7 - 4)	-0.0421876
7.09008 (7/12/2016)	7.26543 (1/6/2016)	(7.09008 - 7.26543)/(8 - 4)	-0.0438382
7.10661 (4/6/2016)	7.30653 (2/18/2016)	(7.10661 - 7.30653)/(6 - 5)	-0.199925
7.13887 (5/26/2016)	7.30653 (2/18/2016)	(7.13887 - 7.30653)/(7 - 5)	-0.0838322
7.09008 (7/12/2016)	7.30653 (2/18/2016)	(7.09008 - 7.30653)/(8 - 5)	-0.0721515
7.13887 (5/26/2016)	7.10661 (4/6/2016)	(7.13887 - 7.10661)/(7 - 6)	0.0322609
7.09008 (7/12/2016)	7.10661 (4/6/2016)	(7.09008 - 7.10661)/(8 - 6)	-0.00826465
7.09008 (7/12/2016)	7.13887 (5/26/2016)	(7.09008 - 7.13887)/(8 - 7)	-0.0487902

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.199925
2	-0.0838322

3	-0.0805805
4	-0.0798014
5	-0.0794118
6	-0.0721515
7	-0.0517858
8	-0.0511867
9	-0.0487902
10	-0.0438382
11	-0.0421876
12	-0.0197394
13	-0.00826465
14	-0.00546497
15	-0.00406513
16	0.00320007
17	0.0124302
18	0.0207081
19	0.0226336
20	0.0322609
21	0.0411017
22	0.0612216
23	0.0712815
24	0.0758665
25	0.0874548
26	0.119801
27	0.171472
28	0.223144

Sen's Estimator (Median Q) is -0.00476505

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/12/2016	1

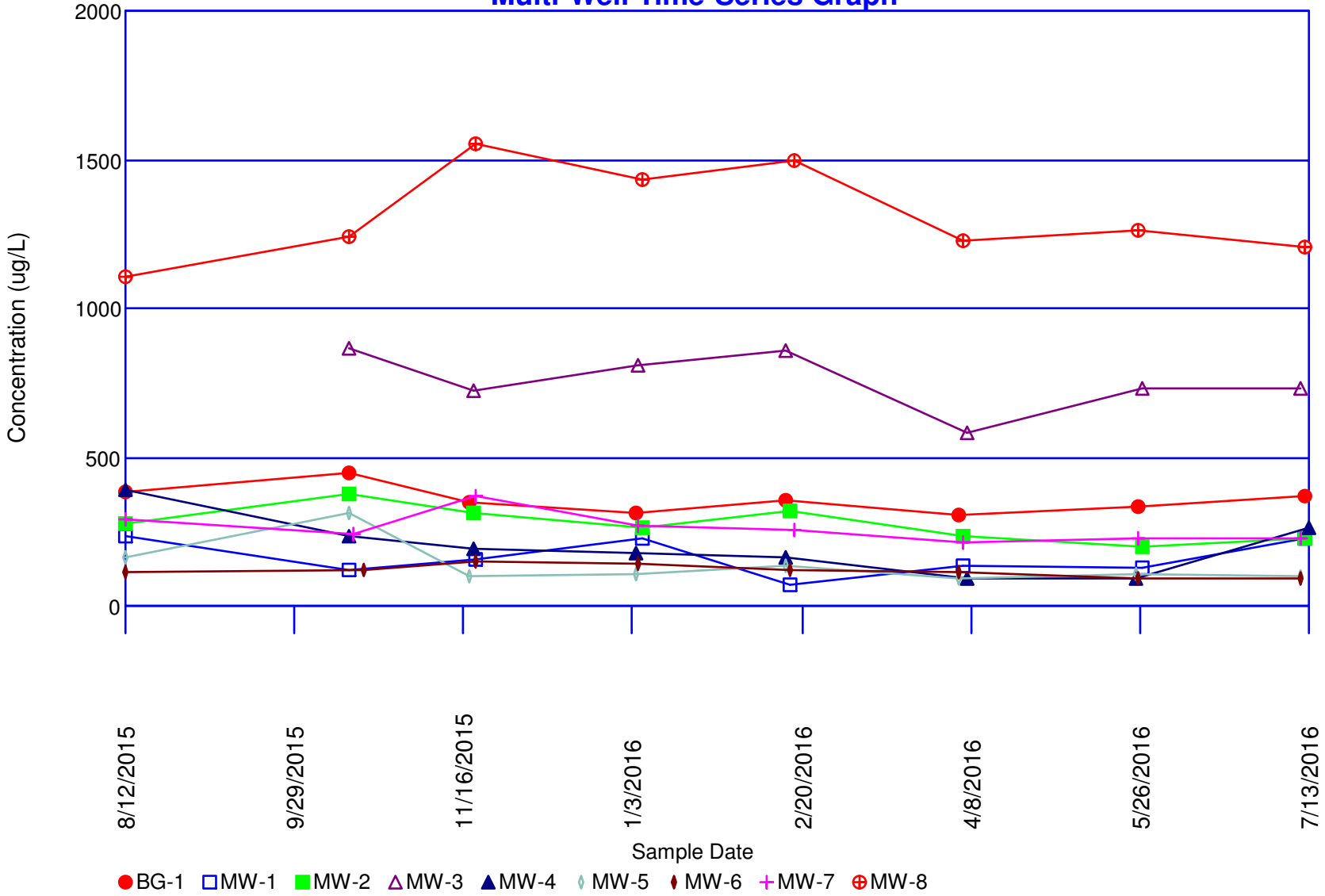
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0517858 = Q(7)
Upper limit is 0.0612216 = Q(22)
-0.0517858 < 0 < 0.0612216 indicating no trend in data.

Barium

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 1
Percent Non-Detects: 1.38889%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	8.5 J	8.5 J
			10/15/2015	6.1	6.1
			11/18/2015	5.9	5.9
			1/4/2016	7.5	7.5
			2/16/2016	5.5	5.5
			4/5/2016	6	6
			5/26/2016	6.1	6.1
			7/12/2016	7	7

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	41	41
			10/15/2015	14.6	14.6
			11/20/2015	14.5	14.5
			1/6/2016	9.6	9.6
			2/17/2016	10	10
			4/6/2016	10.6	10.6
			5/27/2016	9.7	9.7
			7/12/2016	7.9	7.9
MW-2	8	0 (0%)	8/12/2015	51	51
			10/15/2015	25.7	25.7
			11/19/2015	40.9	40.9
			1/6/2016	37.8	37.8
			2/17/2016	37.4	37.4
			4/6/2016	47.3	47.3
			5/27/2016	40.5	40.5
			7/12/2016	39.4	39.4
MW-3	8	0 (0%)	8/12/2015	49	49
			10/15/2015	38	38
			11/19/2015	49.4	49.4
			1/5/2016	42	42
			2/16/2016	35.8	35.8
			4/7/2016	42.7	42.7
			5/27/2016	39	39
			7/11/2016	41.9	41.9

MW-4	8	1 (12.5%)	8/12/2015	12 J	12 J
			10/15/2015	6.2	6.2
			11/19/2015	6.2	6.2
			1/4/2016	7.2	7.2
			2/16/2016	5.7	5.7
			4/7/2016	6.8	6.8
			5/25/2016	6.4	6.4
			7/13/2016	ND<5 U	ND<5 U
MW-5	8	0 (0%)	8/12/2015	16 J	16 J
			10/15/2015	9	9
			11/18/2015	9.9	9.9
			1/4/2016	10.8	10.8
			2/16/2016	10.2	10.2
			4/5/2016	12.1	12.1
			5/25/2016	10.7	10.7
			7/11/2016	9.8	9.8
MW-6	8	0 (0%)	8/12/2015	8.1 J	8.1 J
			10/19/2015	6.7	6.7
			11/20/2015	9.1	9.1
			1/5/2016	8.9	8.9
			2/17/2016	6.6	6.6
			4/5/2016	10.8	10.8
			5/26/2016	6.1	6.1
			7/11/2016	7.7	7.7
MW-7	8	0 (0%)	8/12/2015	110	110
			10/16/2015	53.1	53.1
			11/20/2015	69	69
			1/5/2016	48.3	48.3
			2/18/2016	35.3	35.3
			4/6/2016	32.1	32.1
			5/26/2016	21.2	21.2
			7/11/2016	22.7	22.7
MW-8	8	0 (0%)	8/12/2015	9.9 J	9.9 J
			10/15/2015	6.3	6.3
			11/20/2015	9	9
			1/6/2016	9.2	9.2
			2/18/2016	8.7	8.7
			4/6/2016	8.9	8.9
			5/26/2016	9.3	9.3
			7/12/2016	9.6	9.6

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Boron

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 20.8181

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	8/12/2015	MW-7	110	89.1819
2	11/20/2015	MW-7	69	48.1819
3	10/16/2015	MW-7	53.1	32.2819
4	8/12/2015	MW-2	51	30.1819
5	11/19/2015	MW-3	49.4	28.5819
6	8/12/2015	MW-3	49	28.1819
7	1/5/2016	MW-7	48.3	27.4819
8	4/6/2016	MW-2	47.3	26.4819
9	4/7/2016	MW-3	42.7	21.8819
10	1/5/2016	MW-3	42	21.1819

Iteration i = 9

Mean of 63 measurements = 15.5413
Std Dev = 12.4817
x(i+1) = 42 from measurement 1/5/2016 from location MW-3
Rosner Statistic R = |42 - 15.5413|/12.4817 = 2.11981
Lambda(72, 10, 0.05) = 3.22
2.11981 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 15.9656
Std Dev = 12.8392
x(i+1) = 42.7 from measurement 4/7/2016 from location MW-3
Rosner Statistic R = |42.7 - 15.9656|/12.8392 = 2.08225
Lambda(72, 9, 0.05) = 3.226
2.08225 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 16.4477
Std Dev = 13.3182
x(i+1) = 47.3 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |47.3 - 16.4477|/13.3182 = 2.31656
Lambda(72, 8, 0.05) = 3.232
2.31656 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 16.9303

Std Dev = 13.7847
x(i+1) = 48.3 from measurement 1/5/2016 from location MW-7
Rosner Statistic R = |48.3 - 16.9303|/13.7847 = 2.2757
Lambda(72, 7, 0.05) = 3.238
2.2757 < 3.238 -- No outliers detected for i = 6

Iteration i = 5
Mean of 67 measurements = 17.409
Std Dev = 14.2298
x(i+1) = 49 from measurement 8/12/2015 from location MW-3
Rosner Statistic R = |49 - 17.409|/14.2298 = 2.22006
Lambda(72, 6, 0.05) = 3.244
2.22006 < 3.244 -- No outliers detected for i = 5

Iteration i = 4
Mean of 68 measurements = 17.8794
Std Dev = 14.6464
x(i+1) = 49.4 from measurement 11/19/2015 from location MW-3
Rosner Statistic R = |49.4 - 17.8794|/14.6464 = 2.15211
Lambda(72, 5, 0.05) = 3.25
2.15211 < 3.25 -- No outliers detected for i = 4

Iteration i = 3
Mean of 69 measurements = 18.3594
Std Dev = 15.0751
x(i+1) = 51 from measurement 8/12/2015 from location MW-2
Rosner Statistic R = |51 - 18.3594|/15.0751 = 2.16519
Lambda(72, 4, 0.05) = 3.25
2.16519 < 3.25 -- No outliers detected for i = 3

Iteration i = 2
Mean of 70 measurements = 18.8557
Std Dev = 15.5309
x(i+1) = 53.1 from measurement 10/16/2015 from location MW-7
Rosner Statistic R = |53.1 - 18.8557|/15.5309 = 2.20492
Lambda(72, 3, 0.05) = 3.26
2.20492 < 3.26 -- No outliers detected for i = 2

Iteration i = 1
Mean of 71 measurements = 19.562
Std Dev = 16.5281
x(i+1) = 69 from measurement 11/20/2015 from location MW-7
Rosner Statistic R = |69 - 19.562|/16.5281 = 2.99116
Lambda(72, 2, 0.05) = 3.26
2.99116 < 3.26 -- No outliers detected for i = 1

Iteration i = 0

Mean of 72 measurements = 20.8181
Std Dev = 19.5685
x(i+1) = 110 from measurement 8/12/2015 from location MW-7
Rosner Statistic R = |110 - 20.8181|/19.5685 = 4.55742
Lambda(72, 1, 0.05) = 3.27
4.55742 > 3.27 -- Measurement 8/12/2015 for location MW-7 is an outlier

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 6.575
Background Std Dev = 1.0096

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	7.9	[0, 10.1881]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**39.4**	**[0, 10.1881]**	**TRUE**

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**41.9**	**[0, 10.1881]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	5	[0, 10.1881]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	9.8	[0, 10.1881]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	7.7	[0, 10.1881]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	22.7	[0, 10.1881]	TRUE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	9.6	[0, 10.1881]	FALSE

Confidence Interval

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	6.575
Std Dev	1.0096
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[5.50489, 7.64511]	6.575	TRUE
95%	1.89458	[5.89874, 7.25126]	6.575	TRUE

Compliance Locations

Location	**MW-1**
Mean	14.7375
Std Dev	10.8751
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[3.21057, 26.2644]	14.7375	FALSE
95%	1.89458	[7.45297, 22.022]	14.7375	TRUE

Location	**MW-2**
Mean	40
Std Dev	7.48141
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[32.0702, 47.9298]	40	TRUE
95%	1.89458	[34.9887, 45.0113]	40	TRUE

Location	**MW-3**
Mean	42.225
Std Dev	4.88869
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[37.0433, 47.4067]	42.225	TRUE
95%	1.89458	[38.9504, 45.4996]	42.225	TRUE

Location	**MW-4**
Mean	6.9375
Std Dev	2.15071
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[4.65789, 9.21711]	6.9375	FALSE
95%	1.89458	[5.49688, 8.37812]	6.9375	TRUE

Location	**MW-5**
Mean	11.0625
Std Dev	2.19085
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[8.74034, 13.3847]	11.0625	**TRUE**
95%	1.89458	[9.59499, 12.53]	11.0625	**TRUE**

Location	**MW-6**
Mean	8
Std Dev	1.56844
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.33756, 9.66244]	8	**TRUE**
95%	1.89458	[6.94941, 9.05059]	8	**TRUE**

Location	**MW-7**
Mean	48.9625
Std Dev	29.4621
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[17.7346, 80.1904]	48.9625	**TRUE**
95%	1.89458	[29.2278, 68.6972]	48.9625	**TRUE**

Location	**MW-8**
Mean	8.8625
Std Dev	1.10446
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[7.69185, 10.0332]	8.8625	**TRUE**
95%	1.89458	[8.1227, 9.6023]	8.8625	**TRUE**

Sen's Slope Analysis

Parameter: Boron
Location: MW-2

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
3.24649 (10/15/2015)	3.93183 (8/12/2015)	(3.24649 - 3.93183)/(2 - 1)	-0.685335
3.71113 (11/19/2015)	3.93183 (8/12/2015)	(3.71113 - 3.93183)/(3 - 1)	-0.110348
3.63231 (1/6/2016)	3.93183 (8/12/2015)	(3.63231 - 3.93183)/(4 - 1)	-0.0998388
3.62167 (2/17/2016)	3.93183 (8/12/2015)	(3.62167 - 3.93183)/(5 - 1)	-0.0775387
3.85651 (4/6/2016)	3.93183 (8/12/2015)	(3.85651 - 3.93183)/(6 - 1)	-0.0150631
3.7013 (5/27/2016)	3.93183 (8/12/2015)	(3.7013 - 3.93183)/(7 - 1)	-0.0384206
3.67377 (7/12/2016)	3.93183 (8/12/2015)	(3.67377 - 3.93183)/(8 - 1)	-0.0368657
3.71113 (11/19/2015)	3.24649 (10/15/2015)	(3.71113 - 3.24649)/(3 - 2)	0.464639
3.63231 (1/6/2016)	3.24649 (10/15/2015)	(3.63231 - 3.24649)/(4 - 2)	0.192909
3.62167 (2/17/2016)	3.24649 (10/15/2015)	(3.62167 - 3.24649)/(5 - 2)	0.12506
3.85651 (4/6/2016)	3.24649 (10/15/2015)	(3.85651 - 3.24649)/(6 - 2)	0.152505
3.7013 (5/27/2016)	3.24649 (10/15/2015)	(3.7013 - 3.24649)/(7 - 2)	0.0909622
3.67377 (7/12/2016)	3.24649 (10/15/2015)	(3.67377 - 3.24649)/(8 - 2)	0.0712125
3.63231 (1/6/2016)	3.71113 (11/19/2015)	(3.63231 - 3.71113)/(4 - 3)	-0.078821
3.62167 (2/17/2016)	3.71113 (11/19/2015)	(3.62167 - 3.71113)/(5 - 3)	-0.0447297
3.85651 (4/6/2016)	3.71113 (11/19/2015)	(3.85651 - 3.71113)/(6 - 3)	0.0484601
3.7013 (5/27/2016)	3.71113 (11/19/2015)	(3.7013 - 3.71113)/(7 - 3)	-0.00245702
3.67377 (7/12/2016)	3.71113 (11/19/2015)	(3.67377 - 3.71113)/(8 - 3)	-0.00747285
3.62167 (2/17/2016)	3.63231 (1/6/2016)	(3.62167 - 3.63231)/(5 - 4)	-0.0106384
3.85651 (4/6/2016)	3.63231 (1/6/2016)	(3.85651 - 3.63231)/(6 - 4)	0.112101
3.7013 (5/27/2016)	3.63231 (1/6/2016)	(3.7013 - 3.63231)/(7 - 4)	0.0229976
3.67377 (7/12/2016)	3.63231 (1/6/2016)	(3.67377 - 3.63231)/(8 - 4)	0.0103642
3.85651 (4/6/2016)	3.62167 (2/17/2016)	(3.85651 - 3.62167)/(6 - 5)	0.23484
3.7013 (5/27/2016)	3.62167 (2/17/2016)	(3.7013 - 3.62167)/(7 - 5)	0.0398156
3.67377 (7/12/2016)	3.62167 (2/17/2016)	(3.67377 - 3.62167)/(8 - 5)	0.017365
3.7013 (5/27/2016)	3.85651 (4/6/2016)	(3.7013 - 3.85651)/(7 - 6)	-0.155208
3.67377 (7/12/2016)	3.85651 (4/6/2016)	(3.67377 - 3.85651)/(8 - 6)	-0.0913722
3.67377 (7/12/2016)	3.7013 (5/27/2016)	(3.67377 - 3.7013)/(8 - 7)	-0.0275362

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.685335
2	-0.155208

3	-0.110348
4	-0.0998388
5	-0.0913722
6	-0.078821
7	-0.0775387
8	-0.0447297
9	-0.0384206
10	-0.0368657
11	-0.0275362
12	-0.0150631
13	-0.0106384
14	-0.00747285
15	-0.00245702
16	0.0103642
17	0.017365
18	0.0229976
19	0.0398156
20	0.0484601
21	0.0712125
22	0.0909622
23	0.112101
24	0.12506
25	0.152505
26	0.192909
27	0.23484
28	0.464639

Sen's Estimator (Median Q) is -0.00496494

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0775387 = Q(7)
Upper limit is 0.0909622 = Q(22)
-0.0775387 < 0 < 0.0909622 indicating no trend in data.

Sen's Slope Analysis

Parameter: Boron
Location: MW-3

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
3.63759 (10/15/2015)	3.89182 (8/12/2015)	(3.63759 - 3.89182)/(2 - 1)	-0.254234
3.89995 (11/19/2015)	3.89182 (8/12/2015)	(3.89995 - 3.89182)/(3 - 1)	0.00406506
3.73767 (1/5/2016)	3.89182 (8/12/2015)	(3.73767 - 3.89182)/(4 - 1)	-0.0513836
3.57795 (2/16/2016)	3.89182 (8/12/2015)	(3.57795 - 3.89182)/(5 - 1)	-0.0784681
3.7542 (4/7/2016)	3.89182 (8/12/2015)	(3.7542 - 3.89182)/(6 - 1)	-0.0275243
3.66356 (5/27/2016)	3.89182 (8/12/2015)	(3.66356 - 3.89182)/(7 - 1)	-0.0380431
3.73529 (7/11/2016)	3.89182 (8/12/2015)	(3.73529 - 3.89182)/(8 - 1)	-0.0223621
3.89995 (11/19/2015)	3.63759 (10/15/2015)	(3.89995 - 3.63759)/(3 - 2)	0.262364
3.73767 (1/5/2016)	3.63759 (10/15/2015)	(3.73767 - 3.63759)/(4 - 2)	0.0500417
3.57795 (2/16/2016)	3.63759 (10/15/2015)	(3.57795 - 3.63759)/(5 - 2)	-0.0198794
3.7542 (4/7/2016)	3.63759 (10/15/2015)	(3.7542 - 3.63759)/(6 - 2)	0.0291532
3.66356 (5/27/2016)	3.63759 (10/15/2015)	(3.66356 - 3.63759)/(7 - 2)	0.0051951
3.73529 (7/11/2016)	3.63759 (10/15/2015)	(3.73529 - 3.63759)/(8 - 2)	0.0162833
3.73767 (1/5/2016)	3.89995 (11/19/2015)	(3.73767 - 3.89995)/(4 - 3)	-0.162281
3.57795 (2/16/2016)	3.89995 (11/19/2015)	(3.57795 - 3.89995)/(5 - 3)	-0.161001
3.7542 (4/7/2016)	3.89995 (11/19/2015)	(3.7542 - 3.89995)/(6 - 3)	-0.0485838
3.66356 (5/27/2016)	3.89995 (11/19/2015)	(3.66356 - 3.89995)/(7 - 3)	-0.0590972
3.73529 (7/11/2016)	3.89995 (11/19/2015)	(3.73529 - 3.89995)/(8 - 3)	-0.0329329
3.57795 (2/16/2016)	3.73767 (1/5/2016)	(3.57795 - 3.73767)/(5 - 4)	-0.159722
3.7542 (4/7/2016)	3.73767 (1/5/2016)	(3.7542 - 3.73767)/(6 - 4)	0.00826465
3.66356 (5/27/2016)	3.73767 (1/5/2016)	(3.66356 - 3.73767)/(7 - 4)	-0.0247027
3.73529 (7/11/2016)	3.73767 (1/5/2016)	(3.73529 - 3.73767)/(8 - 4)	-0.000595948
3.7542 (4/7/2016)	3.57795 (2/16/2016)	(3.7542 - 3.57795)/(6 - 5)	0.176251
3.66356 (5/27/2016)	3.57795 (2/16/2016)	(3.66356 - 3.57795)/(7 - 5)	0.0428069
3.73529 (7/11/2016)	3.57795 (2/16/2016)	(3.73529 - 3.57795)/(8 - 5)	0.052446
3.66356 (5/27/2016)	3.7542 (4/7/2016)	(3.66356 - 3.7542)/(7 - 6)	-0.0906373
3.73529 (7/11/2016)	3.7542 (4/7/2016)	(3.73529 - 3.7542)/(8 - 6)	-0.00945655
3.73529 (7/11/2016)	3.66356 (5/27/2016)	(3.73529 - 3.66356)/(8 - 7)	0.0717242

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.254234
2	-0.162281

3	-0.161001
4	-0.159722
5	-0.0906373
6	-0.0784681
7	-0.0590972
8	-0.0513836
9	-0.0485838
10	-0.0380431
11	-0.0329329
12	-0.0275243
13	-0.0247027
14	-0.0223621
15	-0.0198794
16	-0.00945655
17	-0.000595948
18	0.00406506
19	0.0051951
20	0.00826465
21	0.0162833
22	0.0291532
23	0.0428069
24	0.0500417
25	0.052446
26	0.0717242
27	0.176251
28	0.262364

Sen's Estimator (Median Q) is -0.0211207

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0590972 = Q(7)
Upper limit is 0.0291532 = Q(22)
-0.0590972 < 0 < 0.0291532 indicating no trend in data.

Sen's Slope Analysis

Parameter: Boron
Location: MW-7

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
3.97218 (10/16/2015)	4.70048 (8/12/2015)	(3.97218 - 4.70048)/(2 - 1)	-0.728303
4.23411 (11/20/2015)	4.70048 (8/12/2015)	(4.23411 - 4.70048)/(3 - 1)	-0.233187
3.87743 (1/5/2016)	4.70048 (8/12/2015)	(3.87743 - 4.70048)/(4 - 1)	-0.27435
3.56388 (2/18/2016)	4.70048 (8/12/2015)	(3.56388 - 4.70048)/(5 - 1)	-0.284149
3.46886 (4/6/2016)	4.70048 (8/12/2015)	(3.46886 - 4.70048)/(6 - 1)	-0.246325
3.054 (5/26/2016)	4.70048 (8/12/2015)	(3.054 - 4.70048)/(7 - 1)	-0.274413
3.12236 (7/11/2016)	4.70048 (8/12/2015)	(3.12236 - 4.70048)/(8 - 1)	-0.225445
4.23411 (11/20/2015)	3.97218 (10/16/2015)	(4.23411 - 3.97218)/(3 - 2)	0.26193
3.87743 (1/5/2016)	3.97218 (10/16/2015)	(3.87743 - 3.97218)/(4 - 2)	-0.0473727
3.56388 (2/18/2016)	3.97218 (10/16/2015)	(3.56388 - 3.97218)/(5 - 2)	-0.136098
3.46886 (4/6/2016)	3.97218 (10/16/2015)	(3.46886 - 3.97218)/(6 - 2)	-0.12583
3.054 (5/26/2016)	3.97218 (10/16/2015)	(3.054 - 3.97218)/(7 - 2)	-0.183635
3.12236 (7/11/2016)	3.97218 (10/16/2015)	(3.12236 - 3.97218)/(8 - 2)	-0.141635
3.87743 (1/5/2016)	4.23411 (11/20/2015)	(3.87743 - 4.23411)/(4 - 3)	-0.356675
3.56388 (2/18/2016)	4.23411 (11/20/2015)	(3.56388 - 4.23411)/(5 - 3)	-0.335112
3.46886 (4/6/2016)	4.23411 (11/20/2015)	(3.46886 - 4.23411)/(6 - 3)	-0.255083
3.054 (5/26/2016)	4.23411 (11/20/2015)	(3.054 - 4.23411)/(7 - 3)	-0.295026
3.12236 (7/11/2016)	4.23411 (11/20/2015)	(3.12236 - 4.23411)/(8 - 3)	-0.222348
3.56388 (2/18/2016)	3.87743 (1/5/2016)	(3.56388 - 3.87743)/(5 - 4)	-0.313549
3.46886 (4/6/2016)	3.87743 (1/5/2016)	(3.46886 - 3.87743)/(6 - 4)	-0.204288
3.054 (5/26/2016)	3.87743 (1/5/2016)	(3.054 - 3.87743)/(7 - 4)	-0.274477
3.12236 (7/11/2016)	3.87743 (1/5/2016)	(3.12236 - 3.87743)/(8 - 4)	-0.188767
3.46886 (4/6/2016)	3.56388 (2/18/2016)	(3.46886 - 3.56388)/(6 - 5)	-0.0950269
3.054 (5/26/2016)	3.56388 (2/18/2016)	(3.054 - 3.56388)/(7 - 5)	-0.254941
3.12236 (7/11/2016)	3.56388 (2/18/2016)	(3.12236 - 3.56388)/(8 - 5)	-0.147173
3.054 (5/26/2016)	3.46886 (4/6/2016)	(3.054 - 3.46886)/(7 - 6)	-0.414855
3.12236 (7/11/2016)	3.46886 (4/6/2016)	(3.12236 - 3.46886)/(8 - 6)	-0.173246
3.12236 (7/11/2016)	3.054 (5/26/2016)	(3.12236 - 3.054)/(8 - 7)	0.0683637

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.728303
2	-0.414855

3	-0.356675
4	-0.335112
5	-0.313549
6	-0.295026
7	-0.284149
8	-0.274477
9	-0.274413
10	-0.27435
11	-0.255083
12	-0.254941
13	-0.246325
14	-0.233187
15	-0.225445
16	-0.222348
17	-0.204288
18	-0.188767
19	-0.183635
20	-0.173246
21	-0.147173
22	-0.141635
23	-0.136098
24	-0.12583
25	-0.0950269
26	-0.0473727
27	0.0683637
28	0.26193

Sen's Estimator (Median Q) is -0.229316

Time Period	Observations
8/12/2015	1
10/16/2015	1
11/20/2015	1
1/5/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/11/2016	1

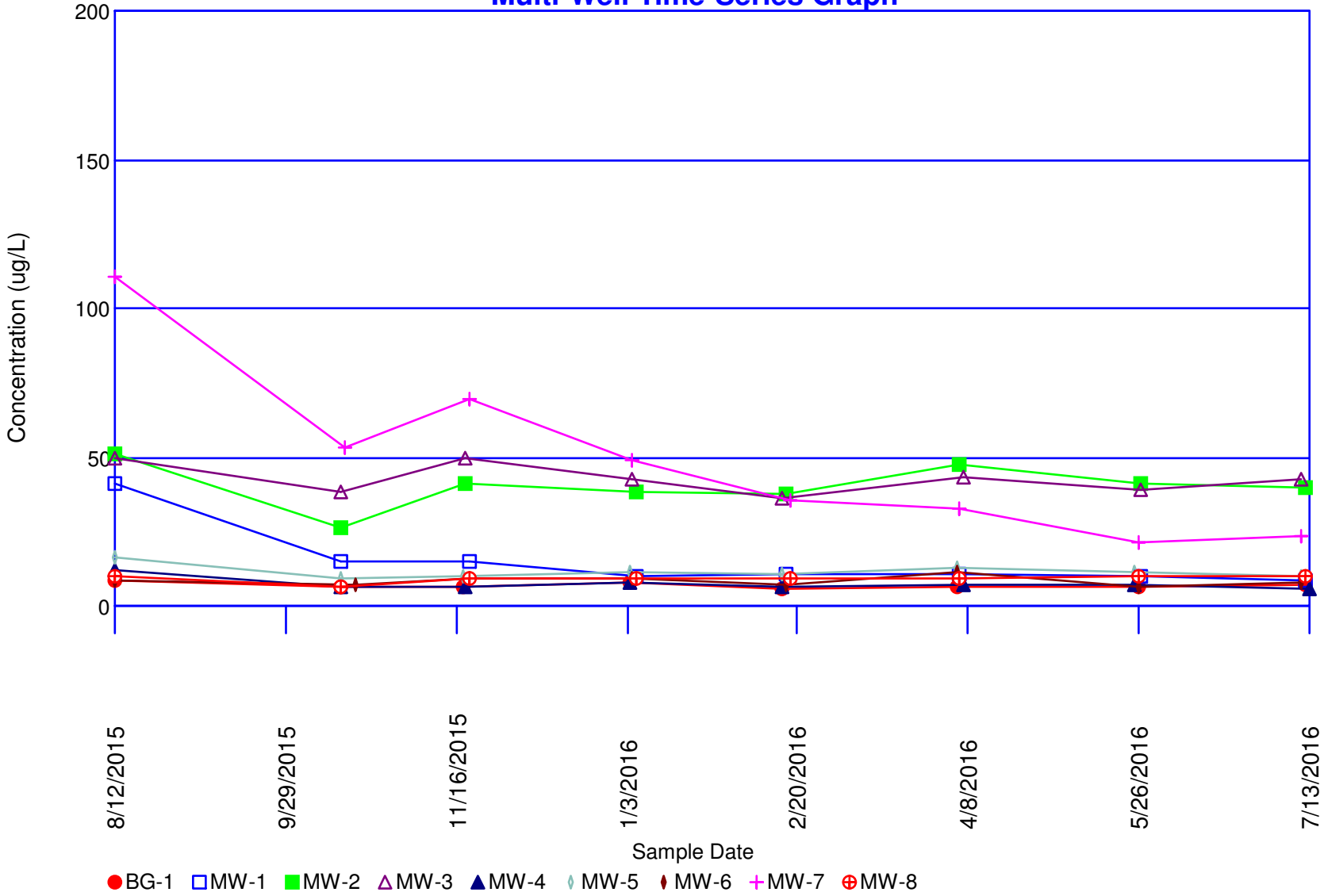
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.284149 = Q(7)
Upper limit is -0.141635 = Q(22)
-0.141635 < 0 indicating a downward trend in data.

Boron

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	32000 B	32000 B
			10/15/2015	38200	38200
			11/18/2015	31700	31700
			1/4/2016	28600	28600
			2/16/2016	29500	29500
			4/5/2016	27300	27300
			5/26/2016	29500	29500
			7/12/2016	31600	31600

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	150000 B	150000 B
			10/15/2015	36500	36500
			11/20/2015	58700	58700
			1/6/2016	108000	108000
			2/17/2016	57700	57700
			4/6/2016	79900	79900
			5/27/2016	87800	87800
			7/12/2016	127000	127000
MW-2	8	0 (0%)	8/12/2015	100000 B	100000 B
			10/15/2015	153000	153000
			11/19/2015	189000	189000
			1/6/2016	188000	188000
			2/17/2016	207000	207000
			4/6/2016	192000	192000
			5/27/2016	130000	130000
			7/12/2016	159000	159000
MW-3	8	0 (0%)	8/12/2015	180000 B	180000 B
			10/15/2015	185000	185000
			11/19/2015	157000	157000
			1/5/2016	188000	188000
			2/16/2016	174000	174000
			4/7/2016	181000	181000
			5/27/2016	161000	161000
			7/11/2016	182000	182000

MW-4	8	0 (0%)	8/12/2015	46000 B	46000 B
			10/15/2015	46200	46200
			11/19/2015	39200	39200
			1/4/2016	35200	35200
			2/16/2016	35200	35200
			4/7/2016	17900	17900
			5/25/2016	18600	18600
			7/13/2016	53500	53500
MW-5	8	0 (0%)	8/12/2015	18000 B	18000 B
			10/15/2015	16900	16900
			11/18/2015	12400	12400
			1/4/2016	13500	13500
			2/16/2016	16900	16900
			4/5/2016	10100	10100
			5/25/2016	11900	11900
			7/11/2016	9990	9990
MW-6	8	0 (0%)	8/12/2015	38000 B	38000 B
			10/19/2015	38100	38100
			11/20/2015	37600	37600
			1/5/2016	35600	35600
			2/17/2016	39200	39200
			4/5/2016	33600	33600
			5/26/2016	33200	33200
			7/11/2016	35400	35400
MW-7	8	0 (0%)	8/12/2015	37000 B	37000 B
			10/16/2015	34200	34200
			11/20/2015	44200	44200
			1/5/2016	45100	45100
			2/18/2016	47900	47900
			4/6/2016	40600	40600
			5/26/2016	51200	51200
			7/11/2016	53200	53200
MW-8	8	0 (0%)	8/12/2015	110000 B	110000 B
			10/15/2015	117000	117000
			11/20/2015	194000	194000
			1/6/2016	162000	162000
			2/18/2016	137000	137000
			4/6/2016	159000	159000
			5/26/2016	144000	144000
			7/12/2016	125000	125000

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Calcium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 81577.6

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	2/17/2016	MW-2	207000	125422
2	11/20/2015	MW-8	194000	112422
3	4/6/2016	MW-2	192000	110422
4	11/19/2015	MW-2	189000	107422
5	1/6/2016	MW-2	188000	106422
6	1/5/2016	MW-3	188000	106422
7	10/15/2015	MW-3	185000	103422
8	7/11/2016	MW-3	182000	100422
9	4/7/2016	MW-3	181000	99422.4
10	8/12/2015	MW-3	180000 B	98422.4

Iteration i = 9

Mean of 63 measurements = 66152.2
Std Dev = 51705.6
x(i+1) = 180000 from measurement 8/12/2015 from location MW-3
Rosner Statistic R = |180000 - 66152.2|/51705.6 = 2.20185
Lambda(72, 10, 0.05) = 3.22
2.20185 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 67946.7
Std Dev = 53264.7
x(i+1) = 181000 from measurement 4/7/2016 from location MW-3
Rosner Statistic R = |181000 - 67946.7|/53264.7 = 2.12248
Lambda(72, 9, 0.05) = 3.226
2.12248 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 69701.4
Std Dev = 54707.6
x(i+1) = 182000 from measurement 7/11/2016 from location MW-3
Rosner Statistic R = |182000 - 69701.4|/54707.6 = 2.05271
Lambda(72, 8, 0.05) = 3.232
2.05271 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 71448.3

Std Dev = 56109.7
x(i+1) = 185000 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |185000 - 71448.3|/56109.7 = 2.02374
Lambda(72, 7, 0.05) = 3.238
2.02374 < 3.238 -- No outliers detected for i = 6

Iteration i = 5

Mean of 67 measurements = 73187.9
Std Dev = 57474.8
x(i+1) = 188000 from measurement 1/5/2016 from location MW-3
Rosner Statistic R = |188000 - 73187.9|/57474.8 = 1.99761
Lambda(72, 6, 0.05) = 3.244
1.99761 < 3.244 -- No outliers detected for i = 5

Iteration i = 4

Mean of 68 measurements = 74876.3
Std Dev = 58718.8
x(i+1) = 188000 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |188000 - 74876.3|/58718.8 = 1.92653
Lambda(72, 5, 0.05) = 3.25
1.92653 < 3.25 -- No outliers detected for i = 4

Iteration i = 3

Mean of 69 measurements = 76530.3
Std Dev = 59882.8
x(i+1) = 189000 from measurement 11/19/2015 from location MW-2
Rosner Statistic R = |189000 - 76530.3|/59882.8 = 1.87816
Lambda(72, 4, 0.05) = 3.25
1.87816 < 3.25 -- No outliers detected for i = 3

Iteration i = 2

Mean of 70 measurements = 78179.9
Std Dev = 61028.3
x(i+1) = 192000 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |192000 - 78179.9|/61028.3 = 1.86504
Lambda(72, 3, 0.05) = 3.26
1.86504 < 3.26 -- No outliers detected for i = 2

Iteration i = 1

Mean of 71 measurements = 79811.1
Std Dev = 62130.3
x(i+1) = 194000 from measurement 11/20/2015 from location MW-8
Rosner Statistic R = |194000 - 79811.1|/62130.3 = 1.83789
Lambda(72, 2, 0.05) = 3.26
1.83789 < 3.26 -- No outliers detected for i = 1

Iteration i = 0

Mean of 72 measurements = 81577.6
Std Dev = 63486.1
x(i+1) = 207000 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |207000 - 81577.6|/63486.1 = 1.97559
Lambda(72, 1, 0.05) = 3.27
1.97559 < 3.27 -- No outliers detected for i = 0

Confidence Interval

Parameter: Calcium

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	31050
Std Dev	3329.95
Degrees of Freedom	7
Comparison Level	**100**
Untransformed Comp. Level	100

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[27520.5, 34579.5]	31050	TRUE
95%	1.89458	[28819.5, 33280.5]	31050	TRUE

Compliance Locations

Location	**MW-1**
Mean	88200
Std Dev	38283.1
Degrees of Freedom	7
Comparison Level	**1000**
Untransformed Comp. Level	1000

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[47622.4, 128778]	88200	TRUE
95%	1.89458	[62556.7, 113843]	88200	TRUE

Location	**MW-2**
Mean	164750
Std Dev	36307.2
Degrees of Freedom	7
Comparison Level	**1000**
Untransformed Comp. Level	1000

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[126267, 203233]	164750	TRUE
95%	1.89458	[140430, 189070]	164750	TRUE

Location	**MW-3**
Mean	176000
Std Dev	11288.4
Degrees of Freedom	7
Comparison Level	**1000**
Untransformed Comp. Level	1000

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[164035, 187965]	176000	TRUE
95%	1.89458	[168439, 183561]	176000	TRUE

Location	**MW-4**
Mean	36475
Std Dev	12819.5
Degrees of Freedom	7
Comparison Level	**1000**
Untransformed Comp. Level	1000

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[22887.2, 50062.8]	36475	TRUE
95%	1.89458	[27888.1, 45061.9]	36475	TRUE

Location	**MW-5**
Mean	13711.3
Std Dev	3177.22
Degrees of Freedom	7
Comparison Level	**100**
Untransformed Comp. Level	100

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[10343.6, 17078.9]	13711.3	**TRUE**
95%	1.89458	[11583, 15839.5]	13711.3	**TRUE**

Location	**MW-6**
Mean	36337.5
Std Dev	2217.42
Degrees of Freedom	7
Comparison Level	**100**
Untransformed Comp. Level	100

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[33987.2, 38687.8]	36337.5	**TRUE**
95%	1.89458	[34852.2, 37822.8]	36337.5	**TRUE**

Location	**MW-7**
Mean	44175
Std Dev	6647.18
Degrees of Freedom	7
Comparison Level	**100**
Untransformed Comp. Level	100

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[37129.4, 51220.6]	44175	**TRUE**
95%	1.89458	[39722.5, 48627.5]	44175	**TRUE**

Location	**MW-8**
Mean	143500
Std Dev	27625
Degrees of Freedom	7
Comparison Level	**1000**
Untransformed Comp. Level	1000

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[114219, 172781]	143500	**TRUE**
95%	1.89458	[124996, 162004]	143500	**TRUE**

Sen's Slope Analysis

Parameter: Calcium
Location: MW-1

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10.5051 (10/15/2015)	11.9184 B (8/12/2015)	(10.5051 - 11.9184)/(2 - 1)	-1.41332
10.9802 (11/20/2015)	11.9184 B (8/12/2015)	(10.9802 - 11.9184)/(3 - 1)	-0.469098
11.5899 (1/6/2016)	11.9184 B (8/12/2015)	(11.5899 - 11.9184)/(4 - 1)	-0.109501
10.963 (2/17/2016)	11.9184 B (8/12/2015)	(10.963 - 11.9184)/(5 - 1)	-0.238845
11.2885 (4/6/2016)	11.9184 B (8/12/2015)	(11.2885 - 11.9184)/(6 - 1)	-0.125972
11.3828 (5/27/2016)	11.9184 B (8/12/2015)	(11.3828 - 11.9184)/(7 - 1)	-0.0892623
11.7519 (7/12/2016)	11.9184 B (8/12/2015)	(11.7519 - 11.9184)/(8 - 1)	-0.0237783
10.9802 (11/20/2015)	10.5051 (10/15/2015)	(10.9802 - 10.5051)/(3 - 2)	0.475127
11.5899 (1/6/2016)	10.5051 (10/15/2015)	(11.5899 - 10.5051)/(4 - 2)	0.542409
10.963 (2/17/2016)	10.5051 (10/15/2015)	(10.963 - 10.5051)/(5 - 2)	0.152648
11.2885 (4/6/2016)	10.5051 (10/15/2015)	(11.2885 - 10.5051)/(6 - 2)	0.195866
11.3828 (5/27/2016)	10.5051 (10/15/2015)	(11.3828 - 10.5051)/(7 - 2)	0.17555
11.7519 (7/12/2016)	10.5051 (10/15/2015)	(11.7519 - 10.5051)/(8 - 2)	0.207812
11.5899 (1/6/2016)	10.9802 (11/20/2015)	(11.5899 - 10.9802)/(4 - 3)	0.609692
10.963 (2/17/2016)	10.9802 (11/20/2015)	(10.963 - 10.9802)/(5 - 3)	-0.00859128
11.2885 (4/6/2016)	10.9802 (11/20/2015)	(11.2885 - 10.9802)/(6 - 3)	0.102779
11.3828 (5/27/2016)	10.9802 (11/20/2015)	(11.3828 - 10.9802)/(7 - 3)	0.100655
11.7519 (7/12/2016)	10.9802 (11/20/2015)	(11.7519 - 10.9802)/(8 - 3)	0.154349
10.963 (2/17/2016)	11.5899 (1/6/2016)	(10.963 - 11.5899)/(5 - 4)	-0.626874
11.2885 (4/6/2016)	11.5899 (1/6/2016)	(11.2885 - 11.5899)/(6 - 4)	-0.150678
11.3828 (5/27/2016)	11.5899 (1/6/2016)	(11.3828 - 11.5899)/(7 - 4)	-0.0690232
11.7519 (7/12/2016)	11.5899 (1/6/2016)	(11.7519 - 11.5899)/(8 - 4)	0.040514
11.2885 (4/6/2016)	10.963 (2/17/2016)	(11.2885 - 10.963)/(6 - 5)	0.325519
11.3828 (5/27/2016)	10.963 (2/17/2016)	(11.3828 - 10.963)/(7 - 5)	0.209902
11.7519 (7/12/2016)	10.963 (2/17/2016)	(11.7519 - 10.963)/(8 - 5)	0.262977
11.3828 (5/27/2016)	11.2885 (4/6/2016)	(11.3828 - 11.2885)/(7 - 6)	0.0942856
11.7519 (7/12/2016)	11.2885 (4/6/2016)	(11.7519 - 11.2885)/(8 - 6)	0.231706
11.7519 (7/12/2016)	11.3828 (5/27/2016)	(11.7519 - 11.3828)/(8 - 7)	0.369126

Number of Q values = 28

Ordered Q Values

n	Q
1	-1.41332
2	-0.626874

3	-0.469098
4	-0.238845
5	-0.150678
6	-0.125972
7	-0.109501
8	-0.0892623
9	-0.0690232
10	-0.0237783
11	-0.00859128
12	0.040514
13	0.0942856
14	0.100655
15	0.102779
16	0.152648
17	0.154349
18	0.17555
19	0.195866
20	0.207812
21	0.209902
22	0.231706
23	0.262977
24	0.325519
25	0.369126
26	0.475127
27	0.542409
28	0.609692

Sen's Estimator (Median Q) is 0.101717

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.109501 = Q(7)
Upper limit is 0.231706 = Q(22)
-0.109501 < 0 < 0.231706 indicating no trend in data.

Sen's Slope Analysis

Parameter: Calcium
Location: MW-2

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
11.9382 (10/15/2015)	11.5129 B (8/12/2015)	(11.9382 - 11.5129)/(2 - 1)	0.425268
12.1495 (11/19/2015)	11.5129 B (8/12/2015)	(12.1495 - 11.5129)/(3 - 1)	0.318288
12.1442 (1/6/2016)	11.5129 B (8/12/2015)	(12.1442 - 11.5129)/(4 - 1)	0.210424
12.2405 (2/17/2016)	11.5129 B (8/12/2015)	(12.2405 - 11.5129)/(5 - 1)	0.181887
12.1653 (4/6/2016)	11.5129 B (8/12/2015)	(12.1653 - 11.5129)/(6 - 1)	0.130465
11.7753 (5/27/2016)	11.5129 B (8/12/2015)	(11.7753 - 11.5129)/(7 - 1)	0.0437274
11.9767 (7/12/2016)	11.5129 B (8/12/2015)	(11.9767 - 11.5129)/(8 - 1)	0.0662477
12.1495 (11/19/2015)	11.9382 (10/15/2015)	(12.1495 - 11.9382)/(3 - 2)	0.211309
12.1442 (1/6/2016)	11.9382 (10/15/2015)	(12.1442 - 11.9382)/(4 - 2)	0.103002
12.2405 (2/17/2016)	11.9382 (10/15/2015)	(12.2405 - 11.9382)/(5 - 2)	0.10076
12.1653 (4/6/2016)	11.9382 (10/15/2015)	(12.1653 - 11.9382)/(6 - 2)	0.0567644
11.7753 (5/27/2016)	11.9382 (10/15/2015)	(11.7753 - 11.9382)/(7 - 2)	-0.0325807
11.9767 (7/12/2016)	11.9382 (10/15/2015)	(11.9767 - 11.9382)/(8 - 2)	0.00641105
12.1442 (1/6/2016)	12.1495 (11/19/2015)	(12.1442 - 12.1495)/(4 - 3)	-0.00530505
12.2405 (2/17/2016)	12.1495 (11/19/2015)	(12.2405 - 12.1495)/(5 - 3)	0.0454859
12.1653 (4/6/2016)	12.1495 (11/19/2015)	(12.1653 - 12.1495)/(6 - 3)	0.00524945
11.7753 (5/27/2016)	12.1495 (11/19/2015)	(11.7753 - 12.1495)/(7 - 3)	-0.0935531
11.9767 (7/12/2016)	12.1495 (11/19/2015)	(11.9767 - 12.1495)/(8 - 3)	-0.0345686
12.2405 (2/17/2016)	12.1442 (1/6/2016)	(12.2405 - 12.1442)/(5 - 4)	0.0962768
12.1653 (4/6/2016)	12.1442 (1/6/2016)	(12.1653 - 12.1442)/(6 - 4)	0.0105267
11.7753 (5/27/2016)	12.1442 (1/6/2016)	(11.7753 - 12.1442)/(7 - 4)	-0.122969
11.9767 (7/12/2016)	12.1442 (1/6/2016)	(11.9767 - 12.1442)/(8 - 4)	-0.0418844
12.1653 (4/6/2016)	12.2405 (2/17/2016)	(12.1653 - 12.2405)/(6 - 5)	-0.0752234
11.7753 (5/27/2016)	12.2405 (2/17/2016)	(11.7753 - 12.2405)/(7 - 5)	-0.232592
11.9767 (7/12/2016)	12.2405 (2/17/2016)	(11.9767 - 12.2405)/(8 - 5)	-0.0879382
11.7753 (5/27/2016)	12.1653 (4/6/2016)	(11.7753 - 12.1653)/(7 - 6)	-0.389961
11.9767 (7/12/2016)	12.1653 (4/6/2016)	(11.9767 - 12.1653)/(8 - 6)	-0.0942956
11.9767 (7/12/2016)	11.7753 (5/27/2016)	(11.9767 - 11.7753)/(8 - 7)	0.20137

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.389961
2	-0.232592

3	-0.122969
4	-0.0942956
5	-0.0935531
6	-0.0879382
7	-0.0752234
8	-0.0418844
9	-0.0345686
10	-0.0325807
11	-0.00530505
12	0.00524945
13	0.00641105
14	0.0105267
15	0.0437274
16	0.0454859
17	0.0567644
18	0.0662477
19	0.0962768
20	0.10076
21	0.103002
22	0.130465
23	0.181887
24	0.20137
25	0.210424
26	0.211309
27	0.318288
28	0.425268

Sen's Estimator (Median Q) is 0.027127

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0752234 = Q(7)
Upper limit is 0.130465 = Q(22)
-0.0752234 < 0 < 0.130465 indicating no trend in data.

Sen's Slope Analysis

Parameter: Calcium
Location: MW-3

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
12.1281 (10/15/2015)	12.1007 B (8/12/2015)	(12.1281 - 12.1007)/(2 - 1)	0.027399
11.964 (11/19/2015)	12.1007 B (8/12/2015)	(11.964 - 12.1007)/(3 - 1)	-0.0683555
12.1442 (1/5/2016)	12.1007 B (8/12/2015)	(12.1442 - 12.1007)/(4 - 1)	0.014495
12.0668 (2/16/2016)	12.1007 B (8/12/2015)	(12.0668 - 12.1007)/(5 - 1)	-0.00847539
12.1063 (4/7/2016)	12.1007 B (8/12/2015)	(12.1063 - 12.1007)/(6 - 1)	0.00110804
11.9892 (5/27/2016)	12.1007 B (8/12/2015)	(11.9892 - 12.1007)/(7 - 1)	-0.0185921
12.1118 (7/11/2016)	12.1007 B (8/12/2015)	(12.1118 - 12.1007)/(8 - 1)	0.00157855
11.964 (11/19/2015)	12.1281 (10/15/2015)	(11.964 - 12.1281)/(3 - 2)	-0.16411
12.1442 (1/5/2016)	12.1281 (10/15/2015)	(12.1442 - 12.1281)/(4 - 2)	0.00804307
12.0668 (2/16/2016)	12.1281 (10/15/2015)	(12.0668 - 12.1281)/(5 - 2)	-0.0204335
12.1063 (4/7/2016)	12.1281 (10/15/2015)	(12.1063 - 12.1281)/(6 - 2)	-0.0054647
11.9892 (5/27/2016)	12.1281 (10/15/2015)	(11.9892 - 12.1281)/(7 - 2)	-0.0277903
12.1118 (7/11/2016)	12.1281 (10/15/2015)	(12.1118 - 12.1281)/(8 - 2)	-0.00272486
12.1442 (1/5/2016)	11.964 (11/19/2015)	(12.1442 - 11.964)/(4 - 3)	0.180196
12.0668 (2/16/2016)	11.964 (11/19/2015)	(12.0668 - 11.964)/(5 - 3)	0.0514047
12.1063 (4/7/2016)	11.964 (11/19/2015)	(12.1063 - 11.964)/(6 - 3)	0.0474171
11.9892 (5/27/2016)	11.964 (11/19/2015)	(11.9892 - 11.964)/(7 - 3)	0.00628964
12.1118 (7/11/2016)	11.964 (11/19/2015)	(12.1118 - 11.964)/(8 - 3)	0.0295522
12.0668 (2/16/2016)	12.1442 (1/5/2016)	(12.0668 - 12.1442)/(5 - 4)	-0.0773867
12.1063 (4/7/2016)	12.1442 (1/5/2016)	(12.1063 - 12.1442)/(6 - 4)	-0.0189725
11.9892 (5/27/2016)	12.1442 (1/5/2016)	(11.9892 - 12.1442)/(7 - 4)	-0.0516792
12.1118 (7/11/2016)	12.1442 (1/5/2016)	(12.1118 - 12.1442)/(8 - 4)	-0.00810882
12.1063 (4/7/2016)	12.0668 (2/16/2016)	(12.1063 - 12.0668)/(6 - 5)	0.0394417
11.9892 (5/27/2016)	12.0668 (2/16/2016)	(11.9892 - 12.0668)/(7 - 5)	-0.0388255
12.1118 (7/11/2016)	12.0668 (2/16/2016)	(12.1118 - 12.0668)/(8 - 5)	0.0149838
11.9892 (5/27/2016)	12.1063 (4/7/2016)	(11.9892 - 12.1063)/(7 - 6)	-0.117093
12.1118 (7/11/2016)	12.1063 (4/7/2016)	(12.1118 - 12.1063)/(8 - 6)	0.00275483
12.1118 (7/11/2016)	11.9892 (5/27/2016)	(12.1118 - 11.9892)/(8 - 7)	0.122602

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.16411
2	-0.117093

3	-0.0773867
4	-0.0683555
5	-0.0516792
6	-0.0388255
7	-0.0277903
8	-0.0204335
9	-0.0189725
10	-0.0185921
11	-0.00847539
12	-0.00810882
13	-0.0054647
14	-0.00272486
15	0.00110804
16	0.00157855
17	0.00275483
18	0.00628964
19	0.00804307
20	0.014495
21	0.0149838
22	0.027399
23	0.0295522
24	0.0394417
25	0.0474171
26	0.0514047
27	0.122602
28	0.180196

Sen's Estimator (Median Q) is -0.00080841

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0277903 = Q(7)
Upper limit is 0.027399 = Q(22)
-0.0277903 < 0 < 0.027399 indicating no trend in data.

Sen's Slope Analysis

Parameter: Calcium
Location: MW-7

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10.44 (10/16/2015)	10.5187 B (8/12/2015)	(10.44 - 10.5187)/(2 - 1)	-0.0786923
10.6965 (11/20/2015)	10.5187 B (8/12/2015)	(10.6965 - 10.5187)/(3 - 1)	0.0889034
10.7166 (1/5/2016)	10.5187 B (8/12/2015)	(10.7166 - 10.5187)/(4 - 1)	0.0659881
10.7769 (2/18/2016)	10.5187 B (8/12/2015)	(10.7769 - 10.5187)/(5 - 1)	0.0645494
10.6115 (4/6/2016)	10.5187 B (8/12/2015)	(10.6115 - 10.5187)/(6 - 1)	0.01857
10.8435 (5/26/2016)	10.5187 B (8/12/2015)	(10.8435 - 10.5187)/(7 - 1)	0.0541369
10.8818 (7/11/2016)	10.5187 B (8/12/2015)	(10.8818 - 10.5187)/(8 - 1)	0.0518772
10.6965 (11/20/2015)	10.44 (10/16/2015)	(10.6965 - 10.44)/(3 - 2)	0.256499
10.7166 (1/5/2016)	10.44 (10/16/2015)	(10.7166 - 10.44)/(4 - 2)	0.138328
10.7769 (2/18/2016)	10.44 (10/16/2015)	(10.7769 - 10.44)/(5 - 2)	0.112297
10.6115 (4/6/2016)	10.44 (10/16/2015)	(10.6115 - 10.44)/(6 - 2)	0.0428856
10.8435 (5/26/2016)	10.44 (10/16/2015)	(10.8435 - 10.44)/(7 - 2)	0.0807028
10.8818 (7/11/2016)	10.44 (10/16/2015)	(10.8818 - 10.44)/(8 - 2)	0.0736388
10.7166 (1/5/2016)	10.6965 (11/20/2015)	(10.7166 - 10.6965)/(4 - 3)	0.0201575
10.7769 (2/18/2016)	10.6965 (11/20/2015)	(10.7769 - 10.6965)/(5 - 3)	0.0401954
10.6115 (4/6/2016)	10.6965 (11/20/2015)	(10.6115 - 10.6965)/(6 - 3)	-0.0283189
10.8435 (5/26/2016)	10.6965 (11/20/2015)	(10.8435 - 10.6965)/(7 - 3)	0.0367537
10.8818 (7/11/2016)	10.6965 (11/20/2015)	(10.8818 - 10.6965)/(8 - 3)	0.0370667
10.7769 (2/18/2016)	10.7166 (1/5/2016)	(10.7769 - 10.7166)/(5 - 4)	0.0602333
10.6115 (4/6/2016)	10.7166 (1/5/2016)	(10.6115 - 10.7166)/(6 - 4)	-0.0525571
10.8435 (5/26/2016)	10.7166 (1/5/2016)	(10.8435 - 10.7166)/(7 - 4)	0.0422858
10.8818 (7/11/2016)	10.7166 (1/5/2016)	(10.8818 - 10.7166)/(8 - 4)	0.041294
10.6115 (4/6/2016)	10.7769 (2/18/2016)	(10.6115 - 10.7769)/(6 - 5)	-0.165347
10.8435 (5/26/2016)	10.7769 (2/18/2016)	(10.8435 - 10.7769)/(7 - 5)	0.033312
10.8818 (7/11/2016)	10.7769 (2/18/2016)	(10.8818 - 10.7769)/(8 - 5)	0.034981
10.8435 (5/26/2016)	10.6115 (4/6/2016)	(10.8435 - 10.6115)/(7 - 6)	0.231971
10.8818 (7/11/2016)	10.6115 (4/6/2016)	(10.8818 - 10.6115)/(8 - 6)	0.135145
10.8818 (7/11/2016)	10.8435 (5/26/2016)	(10.8818 - 10.8435)/(8 - 7)	0.0383189

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.165347
2	-0.0786923

3	-0.0525571
4	-0.0283189
5	0.01857
6	0.0201575
7	0.033312
8	0.034981
9	0.0367537
10	0.0370667
11	0.0383189
12	0.0401954
13	0.041294
14	0.0422858
15	0.0428856
16	0.0518772
17	0.0541369
18	0.0602333
19	0.0645494
20	0.0659881
21	0.0736388
22	0.0807028
23	0.0889034
24	0.112297
25	0.135145
26	0.138328
27	0.231971
28	0.256499

Sen's Estimator (Median Q) is 0.0425857

Time Period	Observations
8/12/2015	1
10/16/2015	1
11/20/2015	1
1/5/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 0.033312 = Q(7)
Upper limit is 0.0807028 = Q(22)
0.033312 > 0 indicating an upward trend in data.

Sen's Slope Analysis

Parameter: Calcium
Location: MW-8

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
11.6699 (10/15/2015)	11.6082 B (8/12/2015)	(11.6699 - 11.6082)/(2 - 1)	0.0616936
12.1756 (11/20/2015)	11.6082 B (8/12/2015)	(12.1756 - 11.6082)/(3 - 1)	0.283689
11.9954 (1/6/2016)	11.6082 B (8/12/2015)	(11.9954 - 11.6082)/(4 - 1)	0.129039
11.8277 (2/18/2016)	11.6082 B (8/12/2015)	(11.8277 - 11.6082)/(5 - 1)	0.0548751
11.9767 (4/6/2016)	11.6082 B (8/12/2015)	(11.9767 - 11.6082)/(6 - 1)	0.0736848
11.8776 (5/26/2016)	11.6082 B (8/12/2015)	(11.8776 - 11.6082)/(7 - 1)	0.0448888
11.7361 (7/12/2016)	11.6082 B (8/12/2015)	(11.7361 - 11.6082)/(8 - 1)	0.0182619
12.1756 (11/20/2015)	11.6699 (10/15/2015)	(12.1756 - 11.6699)/(3 - 2)	0.505684
11.9954 (1/6/2016)	11.6699 (10/15/2015)	(11.9954 - 11.6699)/(4 - 2)	0.162711
11.8277 (2/18/2016)	11.6699 (10/15/2015)	(11.8277 - 11.6699)/(5 - 2)	0.0526023
11.9767 (4/6/2016)	11.6699 (10/15/2015)	(11.9767 - 11.6699)/(6 - 2)	0.0766826
11.8776 (5/26/2016)	11.6699 (10/15/2015)	(11.8776 - 11.6699)/(7 - 2)	0.0415279
11.7361 (7/12/2016)	11.6699 (10/15/2015)	(11.7361 - 11.6699)/(8 - 2)	0.0110233
11.9954 (1/6/2016)	12.1756 (11/20/2015)	(11.9954 - 12.1756)/(4 - 3)	-0.180262
11.8277 (2/18/2016)	12.1756 (11/20/2015)	(11.8277 - 12.1756)/(5 - 3)	-0.173939
11.9767 (4/6/2016)	12.1756 (11/20/2015)	(11.9767 - 12.1756)/(6 - 3)	-0.066318
11.8776 (5/26/2016)	12.1756 (11/20/2015)	(11.8776 - 12.1756)/(7 - 3)	-0.0745112
11.7361 (7/12/2016)	12.1756 (11/20/2015)	(11.7361 - 12.1756)/(8 - 3)	-0.0879089
11.8277 (2/18/2016)	11.9954 (1/6/2016)	(11.8277 - 11.9954)/(5 - 4)	-0.167615
11.9767 (4/6/2016)	11.9954 (1/6/2016)	(11.9767 - 11.9954)/(6 - 4)	-0.00934607
11.8776 (5/26/2016)	11.9954 (1/6/2016)	(11.8776 - 11.9954)/(7 - 4)	-0.039261
11.7361 (7/12/2016)	11.9954 (1/6/2016)	(11.7361 - 11.9954)/(8 - 4)	-0.0648206
11.9767 (4/6/2016)	11.8277 (2/18/2016)	(11.9767 - 11.8277)/(6 - 5)	0.148923
11.8776 (5/26/2016)	11.8277 (2/18/2016)	(11.8776 - 11.8277)/(7 - 5)	0.0249162
11.7361 (7/12/2016)	11.8277 (2/18/2016)	(11.7361 - 11.8277)/(8 - 5)	-0.0305557
11.8776 (5/26/2016)	11.9767 (4/6/2016)	(11.8776 - 11.9767)/(7 - 6)	-0.0990909
11.7361 (7/12/2016)	11.9767 (4/6/2016)	(11.7361 - 11.9767)/(8 - 6)	-0.120295
11.7361 (7/12/2016)	11.8776 (5/26/2016)	(11.7361 - 11.8776)/(8 - 7)	-0.1415

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.180262
2	-0.173939

3	-0.167615
4	-0.1415
5	-0.120295
6	-0.0990909
7	-0.0879089
8	-0.0745112
9	-0.066318
10	-0.0648206
11	-0.039261
12	-0.0305557
13	-0.00934607
14	0.0110233
15	0.0182619
16	0.0249162
17	0.0415279
18	0.0448888
19	0.0526023
20	0.0548751
21	0.0616936
22	0.0736848
23	0.0766826
24	0.129039
25	0.148923
26	0.162711
27	0.283689
28	0.505684

Sen's Estimator (Median Q) is 0.0146426

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/12/2016	1

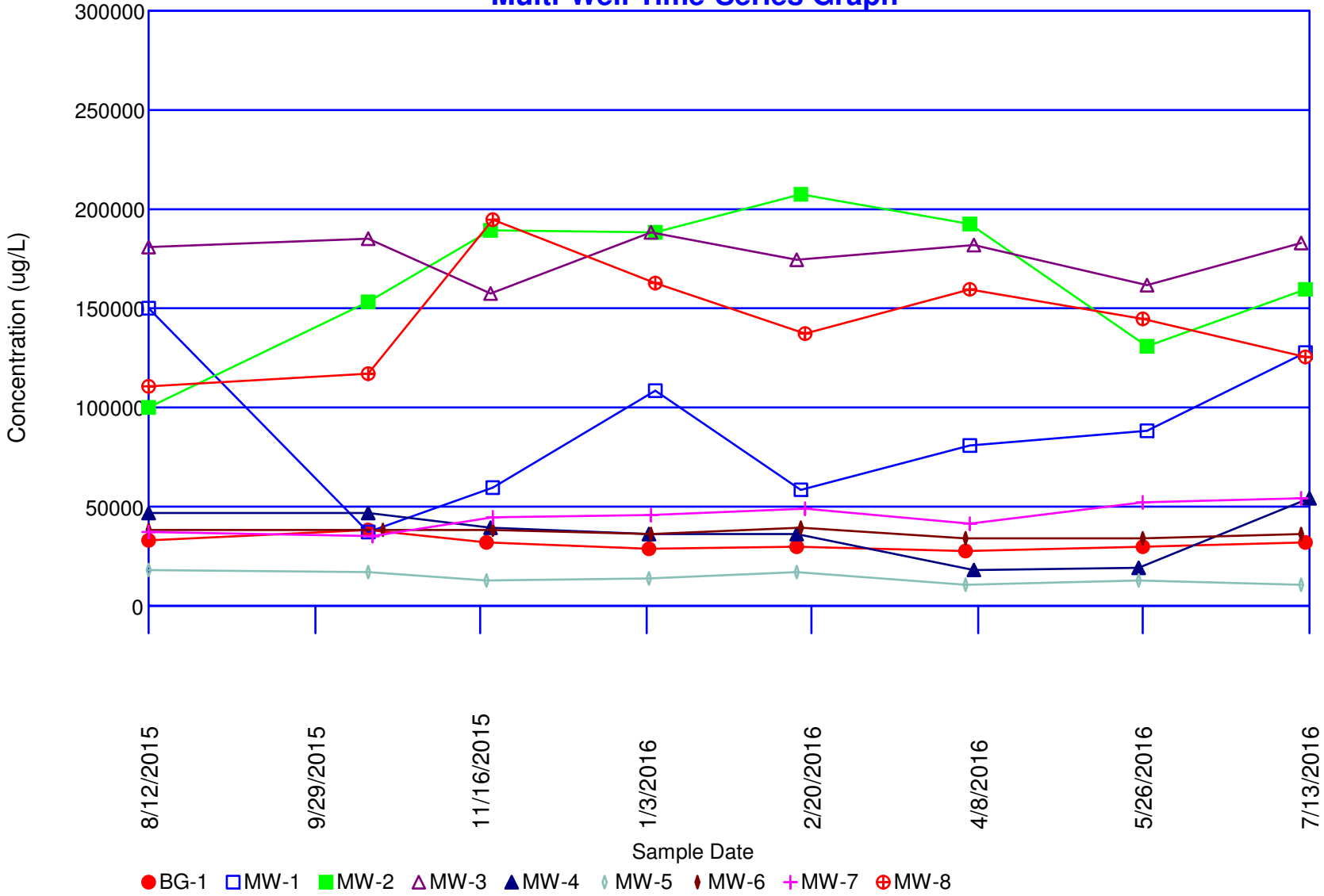
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0879089 = Q(7)
Upper limit is 0.0736848 = Q(22)
-0.0879089 < 0 < 0.0736848 indicating no trend in data.

Calcium

Multi-Well Time-Series Graph



Concentrations (mg/L)

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	270	270
			10/15/2015	311	311
			11/18/2015	283	283
			1/4/2016	285	285
			2/16/2016	277	277
			4/5/2016	264	264
			5/26/2016	250	250
			7/12/2016	292	292

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	580	580
			10/15/2015	72	72
			11/20/2015	172	172
			1/6/2016	446	446
			2/17/2016	167	167
			4/6/2016	342	342
			5/27/2016	307	307
			7/12/2016	547	547
MW-2	8	0 (0%)	8/12/2015	790	790
			10/15/2015	972	972
			11/19/2015	1050	1050
			1/6/2016	910	910
			2/17/2016	1190	1190
			4/6/2016	1230	1230
			5/27/2016	933	933
			7/12/2016	1160	1160
MW-3	8	0 (0%)	8/12/2015	990	990
			10/15/2015	1160	1160
			11/19/2015	1230	1230
			1/5/2016	1270	1270
			2/16/2016	1280	1280
			4/7/2016	1270	1270
			5/27/2016	1130	1130
			7/11/2016	1190	1190

MW-5	9	0 (0%)	8/12/2015	20 J	20 J
			8/12/2015	22	22
			10/15/2015	22.2	22.2
			11/18/2015	21.7	21.7
			1/4/2016	21.9	21.9
			2/16/2016	21.3	21.3
			4/5/2016	18	18
			5/25/2016	19.3	19.3
			7/11/2016	17.6	17.6
MW-6	8	0 (0%)	8/12/2015	230	230
			10/19/2015	241	241
			11/20/2015	242	242
			1/5/2016	252	252
			2/17/2016	242	242
			4/5/2016	15.3	15.3
			5/26/2016	243	243
			7/11/2016	239	239
MW-7	8	0 (0%)	8/12/2015	440	440
			10/16/2015	422	422
			11/20/2015	552	552
			1/5/2016	403	403
			2/18/2016	330	330
			4/6/2016	411	411
			5/26/2016	327	327
			7/11/2016	382	382
MW-8	8	0 (0%)	8/12/2015	480	480
			10/15/2015	515	515
			11/20/2015	939	939
			1/6/2016	755	755
			2/18/2016	663	663
			4/6/2016	685	685
			5/26/2016	396	396
			7/12/2016	504	504
MW-4	7	0 (0%)	10/15/2015	344	344
			11/19/2015	294	294
			1/4/2016	307	307
			2/16/2016	188	188
			4/7/2016	174	174
			5/25/2016	144	144
			7/13/2016	423	423

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Chloride

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 480.365

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	2/16/2016	MW-3	1280	799.635
2	1/5/2016	MW-3	1270	789.635
3	4/7/2016	MW-3	1270	789.635
4	4/6/2016	MW-2	1230	749.635
5	11/19/2015	MW-3	1230	749.635
6	2/17/2016	MW-2	1190	709.635
7	7/11/2016	MW-3	1190	709.635
8	10/15/2015	MW-3	1160	679.635
9	7/12/2016	MW-2	1160	679.635
10	5/27/2016	MW-3	1130	649.635

Iteration i = 9

Mean of 63 measurements = 374.703
Std Dev = 287.585
x(i+1) = 1130 from measurement 5/27/2016 from location MW-3
Rosner Statistic R = |1130 - 374.703|/287.585 = 2.62634
Lambda(72, 10, 0.05) = 3.22
2.62634 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 386.973
Std Dev = 301.709
x(i+1) = 1160 from measurement 7/12/2016 from location MW-2
Rosner Statistic R = |1160 - 386.973|/301.709 = 2.56216
Lambda(72, 9, 0.05) = 3.226
2.56216 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 398.866
Std Dev = 314.323
x(i+1) = 1160 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |1160 - 398.866|/314.323 = 2.4215
Lambda(72, 8, 0.05) = 3.232
2.4215 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 410.853

Std Dev = 326.745
x(i+1) = 1190 from measurement 7/11/2016 from location MW-3
Rosner Statistic R = |1190 - 410.853|/326.745 = 2.38457
Lambda(72, 7, 0.05) = 3.238
2.38457 < 3.238 -- No outliers detected for i = 6

Iteration i = 5

Mean of 67 measurements = 422.482
Std Dev = 337.943
x(i+1) = 1190 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |1190 - 422.482|/337.943 = 2.27115
Lambda(72, 6, 0.05) = 3.244
2.27115 < 3.244 -- No outliers detected for i = 5

Iteration i = 4

Mean of 68 measurements = 434.357
Std Dev = 349.414
x(i+1) = 1230 from measurement 11/19/2015 from location MW-3
Rosner Statistic R = |1230 - 434.357|/349.414 = 2.27707
Lambda(72, 5, 0.05) = 3.25
2.27707 < 3.25 -- No outliers detected for i = 4

Iteration i = 3

Mean of 69 measurements = 445.888
Std Dev = 359.819
x(i+1) = 1230 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |1230 - 445.888|/359.819 = 2.17918
Lambda(72, 4, 0.05) = 3.25
2.17918 < 3.25 -- No outliers detected for i = 3

Iteration i = 2

Mean of 70 measurements = 457.661
Std Dev = 370.534
x(i+1) = 1270 from measurement 4/7/2016 from location MW-3
Rosner Statistic R = |1270 - 457.661|/370.534 = 2.19234
Lambda(72, 3, 0.05) = 3.26
2.19234 < 3.26 -- No outliers detected for i = 2

Iteration i = 1

Mean of 71 measurements = 469.103
Std Dev = 380.3
x(i+1) = 1270 from measurement 1/5/2016 from location MW-3
Rosner Statistic R = |1270 - 469.103|/380.3 = 2.10596
Lambda(72, 2, 0.05) = 3.26
2.10596 < 3.26 -- No outliers detected for i = 1

Iteration i = 0

Mean of 72 measurements = 480.365
Std Dev = 389.518
x(i+1) = 1280 from measurement 2/16/2016 from location MW-3
Rosner Statistic R = |1280 - 480.365|/389.518 = 2.05288
Lambda(72, 1, 0.05) = 3.27
2.05288 < 3.27 -- No outliers detected for i = 0

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 279
Background Std Dev = 18.501

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	547	[0, 345.211]	TRUE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	1160	[0, 345.211]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	1190	[0, 345.211]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	423	[0, 345.211]	TRUE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	17.6	[0, 345.211]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	239	[0, 345.211]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	382	[0, 345.211]	TRUE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	504	[0, 345.211]	TRUE

Confidence Interval

Parameter: Chloride

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	279
Std Dev	18.501
Degrees of Freedom	7
Comparison Level	**6**
Untransformed Comp. Level	6

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[259.39, 298.61]	279	TRUE
95%	1.89458	[266.607, 291.393]	279	TRUE

Compliance Locations

Location	**MW-1**
Mean	329.125
Std Dev	185.86
Degrees of Freedom	7
Comparison Level	**11**
Untransformed Comp. Level	11

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[132.125, 526.125]	329.125	TRUE
95%	1.89458	[204.629, 453.621]	329.125	TRUE

Location	**MW-2**
Mean	1029.38
Std Dev	154.767
Degrees of Freedom	7
Comparison Level	**16**
Untransformed Comp. Level	16

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[865.332, 1193.42]	1029.38	TRUE
95%	1.89458	[925.707, 1133.04]	1029.38	TRUE

Location	**MW-3**
Mean	1190
Std Dev	97.8337
Degrees of Freedom	7
Comparison Level	**20**
Untransformed Comp. Level	20

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[1086.3, 1293.7]	1190	TRUE
95%	1.89458	[1124.47, 1255.53]	1190	TRUE

Location	**MW-4**
Mean	267.714
Std Dev	102.151
Degrees of Freedom	6
Comparison Level	**16**
Untransformed Comp. Level	16

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[146.377, 389.051]	267.714	TRUE
95%	1.94318	[192.689, 342.74]	267.714	TRUE

Location	**MW-5**
Mean	20.4444
Std Dev	1.78543
Degrees of Freedom	8
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.89647	[18.7206, 22.1683]	20.4444	TRUE
95%	1.85955	[19.3377, 21.5511]	20.4444	TRUE

Location	**MW-6**
Mean	213.037
Std Dev	80.1225
Degrees of Freedom	7
Comparison Level	**5**
Untransformed Comp. Level	5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[128.113, 297.962]	213.038	TRUE
95%	1.89458	[159.369, 266.706]	213.037	TRUE

Location	**MW-7**
Mean	408.375
Std Dev	71.023
Degrees of Freedom	7
Comparison Level	**8**
Untransformed Comp. Level	8

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[333.095, 483.655]	408.375	TRUE
95%	1.89458	[360.801, 455.949]	408.375	TRUE

Location	**MW-8**
Mean	617.125
Std Dev	177.382
Degrees of Freedom	7
Comparison Level	**10**
Untransformed Comp. Level	10

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[429.111, 805.139]	617.125	TRUE
95%	1.89458	[498.308, 735.942]	617.125	TRUE

Sen's Slope Analysis

Parameter: Chloride
Location: MW-1

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
4.27667 (10/15/2015)	6.36303 (8/12/2015)	(4.27667 - 6.36303)/(2 - 1)	-2.08636
5.14749 (11/20/2015)	6.36303 (8/12/2015)	(5.14749 - 6.36303)/(3 - 1)	-0.607767
6.10032 (1/6/2016)	6.36303 (8/12/2015)	(6.10032 - 6.36303)/(4 - 1)	-0.0875697
5.11799 (2/17/2016)	6.36303 (8/12/2015)	(5.11799 - 6.36303)/(5 - 1)	-0.311259
5.83481 (4/6/2016)	6.36303 (8/12/2015)	(5.83481 - 6.36303)/(6 - 1)	-0.105643
5.72685 (5/27/2016)	6.36303 (8/12/2015)	(5.72685 - 6.36303)/(7 - 1)	-0.10603
6.30445 (7/12/2016)	6.36303 (8/12/2015)	(6.30445 - 6.36303)/(8 - 1)	-0.00836847
5.14749 (11/20/2015)	4.27667 (10/15/2015)	(5.14749 - 4.27667)/(3 - 2)	0.870828
6.10032 (1/6/2016)	4.27667 (10/15/2015)	(6.10032 - 4.27667)/(4 - 2)	0.911826
5.11799 (2/17/2016)	4.27667 (10/15/2015)	(5.11799 - 4.27667)/(5 - 2)	0.280443
5.83481 (4/6/2016)	4.27667 (10/15/2015)	(5.83481 - 4.27667)/(6 - 2)	0.389536
5.72685 (5/27/2016)	4.27667 (10/15/2015)	(5.72685 - 4.27667)/(7 - 2)	0.290036
6.30445 (7/12/2016)	4.27667 (10/15/2015)	(6.30445 - 4.27667)/(8 - 2)	0.337964
6.10032 (1/6/2016)	5.14749 (11/20/2015)	(6.10032 - 5.14749)/(4 - 3)	0.952824
5.11799 (2/17/2016)	5.14749 (11/20/2015)	(5.11799 - 5.14749)/(5 - 3)	-0.0147503
5.83481 (4/6/2016)	5.14749 (11/20/2015)	(5.83481 - 5.14749)/(6 - 3)	0.229105
5.72685 (5/27/2016)	5.14749 (11/20/2015)	(5.72685 - 5.14749)/(7 - 3)	0.144838
6.30445 (7/12/2016)	5.14749 (11/20/2015)	(6.30445 - 5.14749)/(8 - 3)	0.231391
5.11799 (2/17/2016)	6.10032 (1/6/2016)	(5.11799 - 6.10032)/(5 - 4)	-0.982325
5.83481 (4/6/2016)	6.10032 (1/6/2016)	(5.83481 - 6.10032)/(6 - 4)	-0.132754
5.72685 (5/27/2016)	6.10032 (1/6/2016)	(5.72685 - 6.10032)/(7 - 4)	-0.12449
6.30445 (7/12/2016)	6.10032 (1/6/2016)	(6.30445 - 6.10032)/(8 - 4)	0.0510325
5.83481 (4/6/2016)	5.11799 (2/17/2016)	(5.83481 - 5.11799)/(6 - 5)	0.716817
5.72685 (5/27/2016)	5.11799 (2/17/2016)	(5.72685 - 5.11799)/(7 - 5)	0.304427
6.30445 (7/12/2016)	5.11799 (2/17/2016)	(6.30445 - 5.11799)/(8 - 5)	0.395485
5.72685 (5/27/2016)	5.83481 (4/6/2016)	(5.72685 - 5.83481)/(7 - 6)	-0.107963
6.30445 (7/12/2016)	5.83481 (4/6/2016)	(6.30445 - 5.83481)/(8 - 6)	0.234819
6.30445 (7/12/2016)	5.72685 (5/27/2016)	(6.30445 - 5.72685)/(8 - 7)	0.577601

Number of Q values = 28

Ordered Q Values

n	Q
1	-2.08636
2	-0.982325

3	-0.607767
4	-0.311259
5	-0.132754
6	-0.12449
7	-0.107963
8	-0.10603
9	-0.105643
10	-0.0875697
11	-0.0147503
12	-0.00836847
13	0.0510325
14	0.144838
15	0.229105
16	0.231391
17	0.234819
18	0.280443
19	0.290036
20	0.304427
21	0.337964
22	0.389536
23	0.395485
24	0.577601
25	0.716817
26	0.870828
27	0.911826
28	0.952824

Sen's Estimator (Median Q) is 0.186972

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.107963 = Q(7)
Upper limit is 0.389536 = Q(22)
-0.107963 < 0 < 0.389536 indicating no trend in data.

Sen's Slope Analysis

Parameter: Chloride
Location: MW-2

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.87936 (10/15/2015)	6.67203 (8/12/2015)	(6.87936 - 6.67203)/(2 - 1)	0.207323
6.95655 (11/19/2015)	6.67203 (8/12/2015)	(6.95655 - 6.67203)/(3 - 1)	0.142256
6.81344 (1/6/2016)	6.67203 (8/12/2015)	(6.81344 - 6.67203)/(4 - 1)	0.0471372
7.08171 (2/17/2016)	6.67203 (8/12/2015)	(7.08171 - 6.67203)/(5 - 1)	0.102419
7.11477 (4/6/2016)	6.67203 (8/12/2015)	(7.11477 - 6.67203)/(6 - 1)	0.0885473
6.83841 (5/27/2016)	6.67203 (8/12/2015)	(6.83841 - 6.67203)/(7 - 1)	0.0277287
7.05618 (7/12/2016)	6.67203 (8/12/2015)	(7.05618 - 6.67203)/(8 - 1)	0.0548775
6.95655 (11/19/2015)	6.87936 (10/15/2015)	(6.95655 - 6.87936)/(3 - 2)	0.0771896
6.81344 (1/6/2016)	6.87936 (10/15/2015)	(6.81344 - 6.87936)/(4 - 2)	-0.0329556
7.08171 (2/17/2016)	6.87936 (10/15/2015)	(7.08171 - 6.87936)/(5 - 2)	0.0674509
7.11477 (4/6/2016)	6.87936 (10/15/2015)	(7.11477 - 6.87936)/(6 - 2)	0.0588534
6.83841 (5/27/2016)	6.87936 (10/15/2015)	(6.83841 - 6.87936)/(7 - 2)	-0.00819012
7.05618 (7/12/2016)	6.87936 (10/15/2015)	(7.05618 - 6.87936)/(8 - 2)	0.0294699
6.81344 (1/6/2016)	6.95655 (11/19/2015)	(6.81344 - 6.95655)/(4 - 3)	-0.143101
7.08171 (2/17/2016)	6.95655 (11/19/2015)	(7.08171 - 6.95655)/(5 - 3)	0.0625816
7.11477 (4/6/2016)	6.95655 (11/19/2015)	(7.11477 - 6.95655)/(6 - 3)	0.0527413
6.83841 (5/27/2016)	6.95655 (11/19/2015)	(6.83841 - 6.95655)/(7 - 3)	-0.0295351
7.05618 (7/12/2016)	6.95655 (11/19/2015)	(7.05618 - 6.95655)/(8 - 3)	0.019926
7.08171 (2/17/2016)	6.81344 (1/6/2016)	(7.08171 - 6.81344)/(5 - 4)	0.268264
7.11477 (4/6/2016)	6.81344 (1/6/2016)	(7.11477 - 6.81344)/(6 - 4)	0.150662
6.83841 (5/27/2016)	6.81344 (1/6/2016)	(6.83841 - 6.81344)/(7 - 4)	0.0083202
7.05618 (7/12/2016)	6.81344 (1/6/2016)	(7.05618 - 6.81344)/(8 - 4)	0.0606827
7.11477 (4/6/2016)	7.08171 (2/17/2016)	(7.11477 - 7.08171)/(6 - 5)	0.0330609
6.83841 (5/27/2016)	7.08171 (2/17/2016)	(6.83841 - 7.08171)/(7 - 5)	-0.121652
7.05618 (7/12/2016)	7.08171 (2/17/2016)	(7.05618 - 7.08171)/(8 - 5)	-0.0085111
6.83841 (5/27/2016)	7.11477 (4/6/2016)	(6.83841 - 7.11477)/(7 - 6)	-0.276364
7.05618 (7/12/2016)	7.11477 (4/6/2016)	(7.05618 - 7.11477)/(8 - 6)	-0.0292971
7.05618 (7/12/2016)	6.83841 (5/27/2016)	(7.05618 - 6.83841)/(8 - 7)	0.21777

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.276364
2	-0.143101

3	-0.121652
4	-0.0329556
5	-0.0295351
6	-0.0292971
7	-0.0085111
8	-0.00819012
9	0.0083202
10	0.019926
11	0.0277287
12	0.0294699
13	0.0330609
14	0.0471372
15	0.0527413
16	0.0548775
17	0.0588534
18	0.0606827
19	0.0625816
20	0.0674509
21	0.0771896
22	0.0885473
23	0.102419
24	0.142256
25	0.150662
26	0.207323
27	0.21777
28	0.268264

Sen's Estimator (Median Q) is 0.0499393

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0085111 = Q(7)
Upper limit is 0.0885473 = Q(22)
-0.0085111 < 0 < 0.0885473 indicating no trend in data.

Sen's Slope Analysis

Parameter: Chloride
Location: MW-3

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.05618 (10/15/2015)	6.8977 (8/12/2015)	(7.05618 - 6.8977)/(2 - 1)	0.15847
7.11477 (11/19/2015)	6.8977 (8/12/2015)	(7.11477 - 6.8977)/(3 - 1)	0.108532
7.14677 (1/5/2016)	6.8977 (8/12/2015)	(7.14677 - 6.8977)/(4 - 1)	0.0830224
7.15462 (2/16/2016)	6.8977 (8/12/2015)	(7.15462 - 6.8977)/(5 - 1)	0.0642276
7.14677 (4/7/2016)	6.8977 (8/12/2015)	(7.14677 - 6.8977)/(6 - 1)	0.0498134
7.02997 (5/27/2016)	6.8977 (8/12/2015)	(7.02997 - 6.8977)/(7 - 1)	0.0220447
7.08171 (7/11/2016)	6.8977 (8/12/2015)	(7.08171 - 6.8977)/(8 - 1)	0.0262862
7.11477 (11/19/2015)	7.05618 (10/15/2015)	(7.11477 - 7.05618)/(3 - 2)	0.0585942
7.14677 (1/5/2016)	7.05618 (10/15/2015)	(7.14677 - 7.05618)/(4 - 2)	0.0452984
7.15462 (2/16/2016)	7.05618 (10/15/2015)	(7.15462 - 7.05618)/(5 - 2)	0.0328134
7.14677 (4/7/2016)	7.05618 (10/15/2015)	(7.14677 - 7.05618)/(6 - 2)	0.0226492
7.02997 (5/27/2016)	7.05618 (10/15/2015)	(7.02997 - 7.05618)/(7 - 2)	-0.00524047
7.08171 (7/11/2016)	7.05618 (10/15/2015)	(7.08171 - 7.05618)/(8 - 2)	0.00425555
7.14677 (1/5/2016)	7.11477 (11/19/2015)	(7.14677 - 7.11477)/(4 - 3)	0.0320027
7.15462 (2/16/2016)	7.11477 (11/19/2015)	(7.15462 - 7.11477)/(5 - 3)	0.019923
7.14677 (4/7/2016)	7.11477 (11/19/2015)	(7.14677 - 7.11477)/(6 - 3)	0.0106676
7.02997 (5/27/2016)	7.11477 (11/19/2015)	(7.02997 - 7.11477)/(7 - 3)	-0.0211991
7.08171 (7/11/2016)	7.11477 (11/19/2015)	(7.08171 - 7.11477)/(8 - 3)	-0.00661217
7.15462 (2/16/2016)	7.14677 (1/5/2016)	(7.15462 - 7.14677)/(5 - 4)	0.00784318
7.14677 (4/7/2016)	7.14677 (1/5/2016)	(7.14677 - 7.14677)/(6 - 4)	0
7.02997 (5/27/2016)	7.14677 (1/5/2016)	(7.02997 - 7.14677)/(7 - 4)	-0.0389331
7.08171 (7/11/2016)	7.14677 (1/5/2016)	(7.08171 - 7.14677)/(8 - 4)	-0.0162659
7.14677 (4/7/2016)	7.15462 (2/16/2016)	(7.14677 - 7.15462)/(6 - 5)	-0.00784318
7.02997 (5/27/2016)	7.15462 (2/16/2016)	(7.02997 - 7.15462)/(7 - 5)	-0.0623212
7.08171 (7/11/2016)	7.15462 (2/16/2016)	(7.08171 - 7.15462)/(8 - 5)	-0.0243023
7.02997 (5/27/2016)	7.14677 (4/7/2016)	(7.02997 - 7.14677)/(7 - 6)	-0.116799
7.08171 (7/11/2016)	7.14677 (4/7/2016)	(7.08171 - 7.14677)/(8 - 6)	-0.0325318
7.08171 (7/11/2016)	7.02997 (5/27/2016)	(7.08171 - 7.02997)/(8 - 7)	0.0517357

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.116799
2	-0.0623212

3	-0.0389331
4	-0.0325318
5	-0.0243023
6	-0.0211991
7	-0.0162659
8	-0.00784318
9	-0.00661217
10	-0.00524047
11	0
12	0.00425555
13	0.00784318
14	0.0106676
15	0.019923
16	0.0220447
17	0.0226492
18	0.0262862
19	0.0320027
20	0.0328134
21	0.0452984
22	0.0498134
23	0.0517357
24	0.0585942
25	0.0642276
26	0.0830224
27	0.108532
28	0.15847

Sen's Estimator (Median Q) is 0.0152953

Tied Group	Value	Members
1	7.14677	2

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112

Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -0.0162659 = Q(7)
Upper limit is 0.0498134 = Q(22)
-0.0162659 < 0 < 0.0498134 indicating no trend in data.

Sen's Slope Analysis

Parameter: Chloride
Location: MW-7

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
422 (10/16/2015)	440 (8/12/2015)	(422 - 440)/(2 - 1)	-18
552 (11/20/2015)	440 (8/12/2015)	(552 - 440)/(3 - 1)	56
403 (1/5/2016)	440 (8/12/2015)	(403 - 440)/(4 - 1)	-12.3333
330 (2/18/2016)	440 (8/12/2015)	(330 - 440)/(5 - 1)	-27.5
411 (4/6/2016)	440 (8/12/2015)	(411 - 440)/(6 - 1)	-5.8
327 (5/26/2016)	440 (8/12/2015)	(327 - 440)/(7 - 1)	-18.8333
382 (7/11/2016)	440 (8/12/2015)	(382 - 440)/(8 - 1)	-8.28571
552 (11/20/2015)	422 (10/16/2015)	(552 - 422)/(3 - 2)	130
403 (1/5/2016)	422 (10/16/2015)	(403 - 422)/(4 - 2)	-9.5
330 (2/18/2016)	422 (10/16/2015)	(330 - 422)/(5 - 2)	-30.6667
411 (4/6/2016)	422 (10/16/2015)	(411 - 422)/(6 - 2)	-2.75
327 (5/26/2016)	422 (10/16/2015)	(327 - 422)/(7 - 2)	-19
382 (7/11/2016)	422 (10/16/2015)	(382 - 422)/(8 - 2)	-6.66667
403 (1/5/2016)	552 (11/20/2015)	(403 - 552)/(4 - 3)	-149
330 (2/18/2016)	552 (11/20/2015)	(330 - 552)/(5 - 3)	-111
411 (4/6/2016)	552 (11/20/2015)	(411 - 552)/(6 - 3)	-47
327 (5/26/2016)	552 (11/20/2015)	(327 - 552)/(7 - 3)	-56.25
382 (7/11/2016)	552 (11/20/2015)	(382 - 552)/(8 - 3)	-34
330 (2/18/2016)	403 (1/5/2016)	(330 - 403)/(5 - 4)	-73
411 (4/6/2016)	403 (1/5/2016)	(411 - 403)/(6 - 4)	4
327 (5/26/2016)	403 (1/5/2016)	(327 - 403)/(7 - 4)	-25.3333
382 (7/11/2016)	403 (1/5/2016)	(382 - 403)/(8 - 4)	-5.25
411 (4/6/2016)	330 (2/18/2016)	(411 - 330)/(6 - 5)	81
327 (5/26/2016)	330 (2/18/2016)	(327 - 330)/(7 - 5)	-1.5
382 (7/11/2016)	330 (2/18/2016)	(382 - 330)/(8 - 5)	17.3333
327 (5/26/2016)	411 (4/6/2016)	(327 - 411)/(7 - 6)	-84
382 (7/11/2016)	411 (4/6/2016)	(382 - 411)/(8 - 6)	-14.5
382 (7/11/2016)	327 (5/26/2016)	(382 - 327)/(8 - 7)	55

Number of Q values = 28

Ordered Q Values

n	Q
1	-149
2	-111

3	-84
4	-73
5	-56.25
6	-47
7	-34
8	-30.6667
9	-27.5
10	-25.3333
11	-19
12	-18.8333
13	-18
14	-14.5
15	-12.3333
16	-9.5
17	-8.28571
18	-6.66667
19	-5.8
20	-5.25
21	-2.75
22	-1.5
23	4
24	17.3333
25	55
26	56
27	81
28	130

Sen's Estimator (Median Q) is -13.4167

Time Period	Observations
8/12/2015	1
10/16/2015	1
11/20/2015	1
1/5/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -34 = Q(7)
Upper limit is -1.5 = Q(22)
-1.5 < 0 indicating a downward trend in data.

Sen's Slope Analysis

Parameter: Chloride
Location: MW-8

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
515 (10/15/2015)	480 (8/12/2015)	(515 - 480)/(2 - 1)	35
939 (11/20/2015)	480 (8/12/2015)	(939 - 480)/(3 - 1)	229.5
755 (1/6/2016)	480 (8/12/2015)	(755 - 480)/(4 - 1)	91.6667
663 (2/18/2016)	480 (8/12/2015)	(663 - 480)/(5 - 1)	45.75
685 (4/6/2016)	480 (8/12/2015)	(685 - 480)/(6 - 1)	41
396 (5/26/2016)	480 (8/12/2015)	(396 - 480)/(7 - 1)	-14
504 (7/12/2016)	480 (8/12/2015)	(504 - 480)/(8 - 1)	3.42857
939 (11/20/2015)	515 (10/15/2015)	(939 - 515)/(3 - 2)	424
755 (1/6/2016)	515 (10/15/2015)	(755 - 515)/(4 - 2)	120
663 (2/18/2016)	515 (10/15/2015)	(663 - 515)/(5 - 2)	49.3333
685 (4/6/2016)	515 (10/15/2015)	(685 - 515)/(6 - 2)	42.5
396 (5/26/2016)	515 (10/15/2015)	(396 - 515)/(7 - 2)	-23.8
504 (7/12/2016)	515 (10/15/2015)	(504 - 515)/(8 - 2)	-1.83333
755 (1/6/2016)	939 (11/20/2015)	(755 - 939)/(4 - 3)	-184
663 (2/18/2016)	939 (11/20/2015)	(663 - 939)/(5 - 3)	-138
685 (4/6/2016)	939 (11/20/2015)	(685 - 939)/(6 - 3)	-84.6667
396 (5/26/2016)	939 (11/20/2015)	(396 - 939)/(7 - 3)	-135.75
504 (7/12/2016)	939 (11/20/2015)	(504 - 939)/(8 - 3)	-87
663 (2/18/2016)	755 (1/6/2016)	(663 - 755)/(5 - 4)	-92
685 (4/6/2016)	755 (1/6/2016)	(685 - 755)/(6 - 4)	-35
396 (5/26/2016)	755 (1/6/2016)	(396 - 755)/(7 - 4)	-119.667
504 (7/12/2016)	755 (1/6/2016)	(504 - 755)/(8 - 4)	-62.75
685 (4/6/2016)	663 (2/18/2016)	(685 - 663)/(6 - 5)	22
396 (5/26/2016)	663 (2/18/2016)	(396 - 663)/(7 - 5)	-133.5
504 (7/12/2016)	663 (2/18/2016)	(504 - 663)/(8 - 5)	-53
396 (5/26/2016)	685 (4/6/2016)	(396 - 685)/(7 - 6)	-289
504 (7/12/2016)	685 (4/6/2016)	(504 - 685)/(8 - 6)	-90.5
504 (7/12/2016)	396 (5/26/2016)	(504 - 396)/(8 - 7)	108

Number of Q values = 28

Ordered Q Values

n	Q
1	-289
2	-184

3	-138
4	-135.75
5	-133.5
6	-119.667
7	-92
8	-90.5
9	-87
10	-84.6667
11	-62.75
12	-53
13	-35
14	-23.8
15	-14
16	-1.83333
17	3.42857
18	22
19	35
20	41
21	42.5
22	45.75
23	49.3333
24	91.6667
25	108
26	120
27	229.5
28	424

Sen's Estimator (Median Q) is -18.9

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/12/2016	1

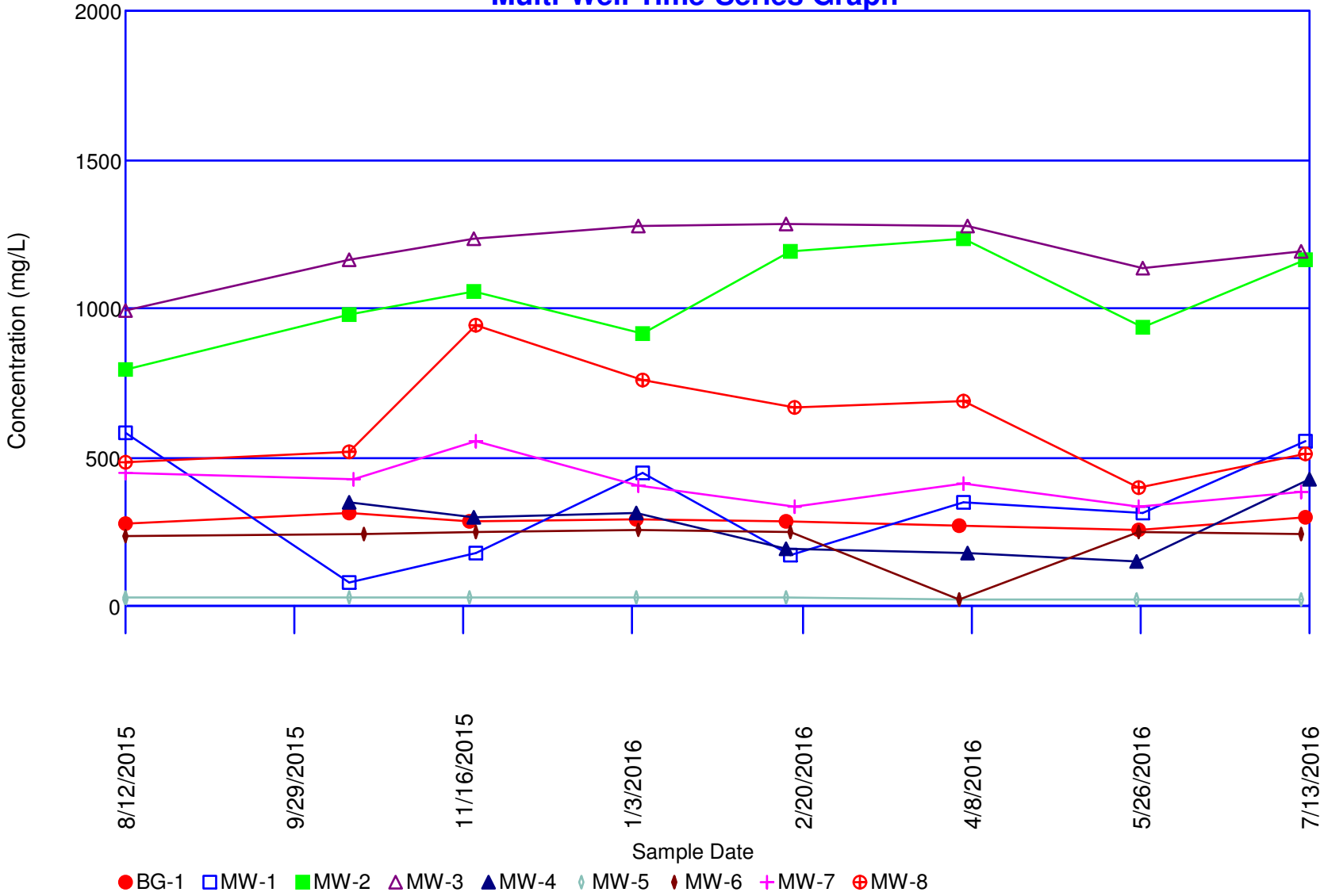
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -92 = Q(7)
Upper limit is 45.75 = Q(22)
-92 < 0 < 45.75 indicating no trend in data.

Chloride

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 73
Total Non-Detect: 54
Percent Non-Detects: 73.9726%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	8 (100%)	8/12/2015	ND<5 U	ND<5 U
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	7 (87.5%)	8/12/2015	1.1 J	1.1 J
			10/15/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/6/2016	ND<5 U	ND<5 U
			2/17/2016	ND<5 U	ND<5 U
			4/6/2016	ND<5 U	ND<5 U
			5/27/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U
MW-2	8	1 (12.5%)	8/12/2015	6	6
			10/15/2015	13	13
			11/19/2015	7.2	7.2
			1/6/2016	15.8	15.8
			2/17/2016	23.3	23.3
			4/6/2016	5.7	5.7
			5/27/2016	ND<5 U	ND<5 U
			7/12/2016	5.2	5.2
MW-3	9	7 (77.7778%)	8/12/2015	1.1 J	1.1 J
			8/12/2015	1.2 J	1.2 J
			10/15/2015	ND<5 U	ND<5 U
			11/19/2015	ND<5 U	ND<5 U
			1/5/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/7/2016	ND<5 U	ND<5 U
			5/27/2016	ND<5 U	ND<5 U

			7/11/2016	ND<5 U	ND<5 U
MW-4	8	7 (87.5%)	8/12/2015	2.5 J	2.5 J
			10/15/2015	ND<5 U	ND<5 U
			11/19/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/7/2016	ND<5 U	ND<5 U
			5/25/2016	ND<5 U	ND<5 U
			7/13/2016	ND<5 U	ND<5 U
MW-5	8	6 (75%)	8/12/2015	1.8 J	1.8 J
			10/15/2015	10.8	10.8
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/25/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-6	8	7 (87.5%)	8/12/2015	0.75 J	0.75 J
			10/19/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/5/2016	ND<5 U	ND<5 U
			2/17/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-7	8	5 (62.5%)	8/12/2015	0.93 J	0.93 J
			10/16/2015	10.7	10.7
			11/20/2015	ND<5 U	ND<5 U
			1/5/2016	ND<5 U	ND<5 U
			2/18/2016	23.7	23.7
			4/6/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-8	8	6 (75%)	8/12/2015	1.7 J	1.7 J
			10/15/2015	33.9	33.9
			11/20/2015	ND<5 U	ND<5 U
			1/6/2016	ND<5 U	ND<5 U
			2/18/2016	ND<5 U	ND<5 U
			4/6/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Chromium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 5.97781

10 most extreme of 73 measurements

by order of magnitude difference from the mean

1	10/15/2015	MW-8	33.9	27.9222
2	2/18/2016	MW-7	23.7	17.7222
3	2/17/2016	MW-2	23.3	17.3222
4	1/6/2016	MW-2	15.8	9.82219
5	10/15/2015	MW-2	13	7.02219
6	8/12/2015	MW-6	0.75 J	-5.22781
7	8/12/2015	MW-7	0.93 J	-5.04781
8	8/12/2015	MW-3	1.1 J	-4.87781
9	8/12/2015	MW-1	1.1 J	-4.87781
10	10/15/2015	MW-5	10.8	4.82219

Iteration i = 9

Mean of 64 measurements = 5.04375
Std Dev = 1.34635
x(i+1) = 10.8 from measurement 10/15/2015 from location MW-5
Rosner Statistic R = |10.8 - 5.04375|/1.34635 = 4.27545
Lambda(73, 10, 0.05) = 3.225
4.27545 > 3.225 -- Measurement 10/15/2015 for location MW-5 is an outlier

---

Iteration i = 8

Mean of 65 measurements = 4.98308
Std Dev = 1.42254
x(i+1) = 1.1 from measurement 8/12/2015 from location MW-1
Rosner Statistic R = |1.1 - 4.98308|/1.42254 = 2.72968
Lambda(73, 9, 0.05) = 3.231
Measurement 8/12/2015 for location MW-1 is an outlier

Iteration i = 7

Mean of 66 measurements = 4.92424
Std Dev = 1.49028
x(i+1) = 1.1 from measurement 8/12/2015 from location MW-3
Rosner Statistic R = |1.1 - 4.92424|/1.49028 = 2.56612
Lambda(73, 8, 0.05) = 3.237
Measurement 8/12/2015 for location MW-3 is an outlier

Iteration i = 6

Mean of 67 measurements = 4.86463

Std Dev = 1.55737
x(i+1) = 0.93 from measurement 8/12/2015 from location MW-7
Rosner Statistic R = |0.93 - 4.86463|/1.55737 = 2.52645
Lambda(73, 7, 0.05) = 3.243
Measurement 8/12/2015 for location MW-7 is an outlier

Iteration i = 5

Mean of 68 measurements = 4.80412
Std Dev = 1.62425
x(i+1) = 0.75 from measurement 8/12/2015 from location MW-6
Rosner Statistic R = |0.75 - 4.80412|/1.62425 = 2.496
Lambda(73, 6, 0.05) = 3.249
Measurement 8/12/2015 for location MW-6 is an outlier

Iteration i = 4

Mean of 69 measurements = 4.9229
Std Dev = 1.89021
x(i+1) = 13 from measurement 10/15/2015 from location MW-2
Rosner Statistic R = |13 - 4.9229|/1.89021 = 4.27312
Lambda(73, 5, 0.05) = 3.255
Measurement 10/15/2015 for location MW-2 is an outlier

Iteration i = 3

Mean of 70 measurements = 5.07829
Std Dev = 2.28282
x(i+1) = 15.8 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |15.8 - 5.07829|/2.28282 = 4.69669
Lambda(73, 4, 0.05) = 3.255
Measurement 1/6/2016 for location MW-2 is an outlier

Iteration i = 2

Mean of 71 measurements = 5.33493
Std Dev = 3.13262
x(i+1) = 23.3 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |23.3 - 5.33493|/3.13262 = 5.73483
Lambda(73, 3, 0.05) = 3.265
Measurement 2/17/2016 for location MW-2 is an outlier

Iteration i = 1

Mean of 72 measurements = 5.59
Std Dev = 3.78939
x(i+1) = 23.7 from measurement 2/18/2016 from location MW-7
Rosner Statistic R = |23.7 - 5.59|/3.78939 = 4.77913
Lambda(73, 2, 0.05) = 3.265
Measurement 2/18/2016 for location MW-7 is an outlier

Iteration i = 0

Mean of 73 measurements = 5.97781

Std Dev = 5.01387

x(i+1) = 33.9 from measurement 10/15/2015 from location MW-8

Rosner Statistic R = |33.9 - 5.97781|/5.01387 = 5.56899

Lambda(73, 1, 0.05) = 3.275

Measurement 10/15/2015 for location MW-8 is an outlier

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 73.9726%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 5
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	**7/12/2016**	**1**	**5.2**	**TRUE**
MW-3	7/11/2016	1	5	FALSE
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

Non-Parametric Confidence Interval

Parameter: Chromium
Well: MW-2
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

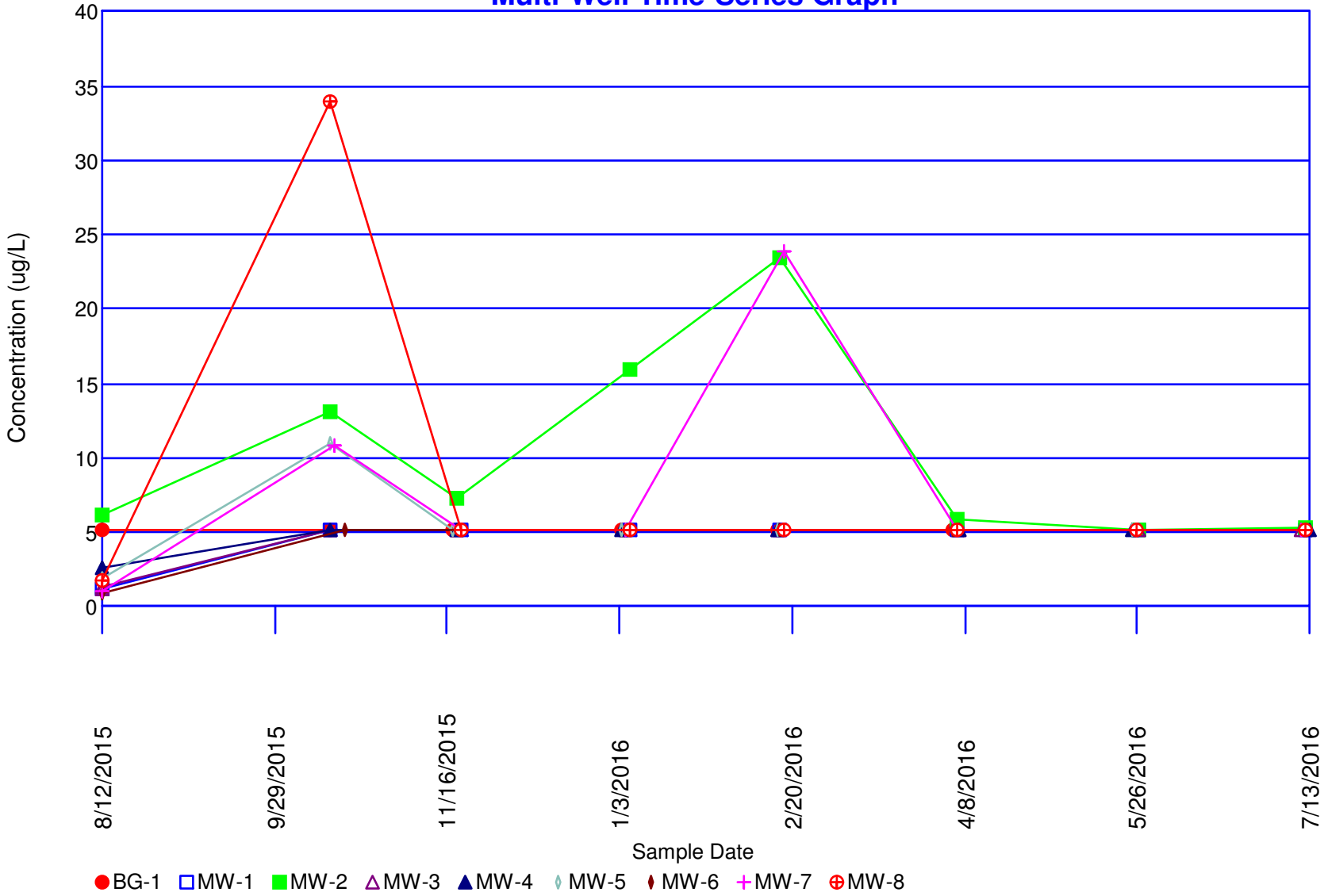
Point	Date	Value	Rank
MW-2	5/27/2016	ND<5 U	1
MW-2	7/12/2016	5.2	2
MW-2	4/6/2016	5.7	3
MW-2	8/12/2015	6	4
MW-2	11/19/2015	7.2	5
MW-2	10/15/2015	13	6
MW-2	1/6/2016	15.8	7
MW-2	2/17/2016	23.3	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 23.3
Lower Confidence Inverval X(1) = 5
5 > 0 Indicating Statistical Significance

Chromium

Multi-Well Time-Series Graph



Concentrations (mg/L)

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 10
Percent Non-Detects: 13.8889%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	0.22 J	0.22 J
			10/15/2015	0.1	0.1
			11/18/2015	0.12	0.12
			1/4/2016	0.13	0.13
			2/16/2016	0.13	0.13
			4/5/2016	0.13	0.13
			5/26/2016	0.12	0.12
			7/12/2016	0.11	0.11

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	0.23 J	0.23 J
			10/15/2015	0.16	0.16
			11/20/2015	0.16	0.16
			1/6/2016	0.14	0.14
			2/17/2016	0.16	0.16
			4/6/2016	0.13	0.13
			5/27/2016	0.11	0.11
			7/12/2016	0.12	0.12
MW-2	8	1 (12.5%)	8/12/2015	ND<2.5 U	ND<2.5 U
			10/15/2015	0.34	0.34
			11/19/2015	0.3	0.3
			1/6/2016	0.29	0.29
			2/17/2016	0.22	0.22
			4/6/2016	0.22	0.22
			5/27/2016	0.13	0.13
			7/12/2016	0.14	0.14
MW-3	8	1 (12.5%)	8/12/2015	ND<2.5 U	ND<2.5 U
			10/15/2015	0.22	0.22
			11/19/2015	0.22	0.22
			1/5/2016	0.26	0.26
			2/16/2016	0.21	0.21
			4/7/2016	0.22	0.22
			5/27/2016	0.21	0.21
			7/11/2016	0.26	0.26

MW-4	8	0 (0%)	8/12/2015	0.51	0.51
			10/15/2015	0.28	0.28
			11/19/2015	0.34	0.34
			1/4/2016	0.35	0.35
			2/16/2016	0.36	0.36
			4/7/2016	0.42	0.42
			5/25/2016	0.42	0.42
			7/13/2016	0.34	0.34
MW-5	8	0 (0%)	8/12/2015	0.74	0.74
			10/15/2015	0.59	0.59
			11/18/2015	0.59	0.59
			1/4/2016	0.56	0.56
			2/16/2016	0.55	0.55
			4/5/2016	0.52	0.52
			5/25/2016	0.5	0.5
			7/11/2016	0.5	0.5
MW-6	8	0 (0%)	8/12/2015	0.49 J	0.49 J
			10/19/2015	0.45	0.45
			11/20/2015	0.39	0.39
			1/5/2016	0.41	0.41
			2/17/2016	0.34	0.34
			4/5/2016	0.18	0.18
			5/26/2016	0.46	0.46
			7/11/2016	0.31	0.31
MW-7	8	0 (0%)	8/12/2015	0.45 J	0.45 J
			10/16/2015	0.38	0.38
			11/20/2015	0.37	0.37
			1/5/2016	0.35	0.35
			2/18/2016	0.27	0.27
			4/6/2016	0.26	0.26
			5/26/2016	0.22	0.22
			7/11/2016	0.21	0.21
MW-8	8	8 (100%)	8/12/2015	ND<0.5 U	ND<0.5 U
			10/15/2015	ND<0.1 U	ND<0.1 U
			11/20/2015	ND<0.1 U	ND<0.1 U
			1/6/2016	ND<0.1 U	ND<0.1 U
			2/18/2016	ND<0.1 U	ND<0.1 U
			4/6/2016	ND<0.1 U	ND<0.1 U
			5/26/2016	ND<0.1 U	ND<0.1 U
			7/12/2016	ND<0.1 U	ND<0.1 U

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Fluoride

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 0.344722

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	8/12/2015	MW-3	ND<2.5 U	2.15528
2	8/12/2015	MW-2	ND<2.5 U	2.15528
3	8/12/2015	MW-5	0.74	0.395278
4	11/18/2015	MW-5	0.59	0.245278
5	10/15/2015	MW-5	0.59	0.245278
6	10/15/2015	MW-8	ND<0.1 U	-0.244722
7	5/26/2016	MW-8	ND<0.1 U	-0.244722
8	4/6/2016	MW-8	ND<0.1 U	-0.244722
9	7/12/2016	MW-8	ND<0.1 U	-0.244722
10	11/20/2015	MW-8	ND<0.1 U	-0.244722

Iteration i = 9

Mean of 63 measurements = 0.277778
Std Dev = 0.137494
x(i+1) = 0.1 from measurement 11/20/2015 from location MW-8
Rosner Statistic R = |0.1 - 0.277778|/0.137494 = 1.29298
Lambda(72, 10, 0.05) = 3.22
1.29298 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 0.275
Std Dev = 0.138197
x(i+1) = 0.1 from measurement 7/12/2016 from location MW-8
Rosner Statistic R = |0.1 - 0.275|/0.138197 = 1.26631
Lambda(72, 9, 0.05) = 3.226
1.26631 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 0.272308
Std Dev = 0.138821
x(i+1) = 0.1 from measurement 4/6/2016 from location MW-8
Rosner Statistic R = |0.1 - 0.272308|/0.138821 = 1.24123
Lambda(72, 8, 0.05) = 3.232
1.24123 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 0.269697

Std Dev = 0.139372
x(i+1) = 0.1 from measurement 5/26/2016 from location MW-8
Rosner Statistic R = |0.1 - 0.269697|/0.139372 = 1.21758
Lambda(72, 7, 0.05) = 3.238
1.21758 < 3.238 -- No outliers detected for i = 6

Iteration i = 5

Mean of 67 measurements = 0.267164
Std Dev = 0.139857
x(i+1) = 0.1 from measurement 10/15/2015 from location MW-8
Rosner Statistic R = |0.1 - 0.267164|/0.139857 = 1.19525
Lambda(72, 6, 0.05) = 3.244
1.19525 < 3.244 -- No outliers detected for i = 5

Iteration i = 4

Mean of 68 measurements = 0.271912
Std Dev = 0.144225
x(i+1) = 0.59 from measurement 10/15/2015 from location MW-5
Rosner Statistic R = |0.59 - 0.271912|/0.144225 = 2.2055
Lambda(72, 5, 0.05) = 3.25
2.2055 < 3.25 -- No outliers detected for i = 4

Iteration i = 3

Mean of 69 measurements = 0.276522
Std Dev = 0.148193
x(i+1) = 0.59 from measurement 11/18/2015 from location MW-5
Rosner Statistic R = |0.59 - 0.276522|/0.148193 = 2.11533
Lambda(72, 4, 0.05) = 3.25
2.11533 < 3.25 -- No outliers detected for i = 3

Iteration i = 2

Mean of 70 measurements = 0.283143
Std Dev = 0.1572
x(i+1) = 0.74 from measurement 8/12/2015 from location MW-5
Rosner Statistic R = |0.74 - 0.283143|/0.1572 = 2.90622
Lambda(72, 3, 0.05) = 3.26
2.90622 < 3.26 -- No outliers detected for i = 2

Iteration i = 1

Mean of 71 measurements = 0.314366
Std Dev = 0.305903
x(i+1) = 2.5 from measurement 8/12/2015 from location MW-2
Rosner Statistic R = |2.5 - 0.314366|/0.305903 = 7.14487
Lambda(72, 2, 0.05) = 3.26
7.14487 > 3.26 -- Measurement 8/12/2015 for location MW-2 is an outlier

Iteration i = 0

Mean of 72 measurements = 0.344722

Std Dev = 0.398253

x(i+1) = 2.5 from measurement 8/12/2015 from location MW-3

Rosner Statistic R = |2.5 - 0.344722|/0.398253 = 5.41183

Lambda(72, 1, 0.05) = 3.27

Measurement 8/12/2015 for location MW-3 is an outlier

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Fluoride

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 0.1325
Background Std Dev = 0.0369362

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.12	[0, 0.264686]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.14	[0, 0.264686]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.26	[0, 0.264686]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	**1**	**0.34**	**[0, 0.264686]**	**TRUE**

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**0.5**	**[0, 0.264686]**	**TRUE**

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**0.31**	**[0, 0.264686]**	**TRUE**

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.21	[0, 0.264686]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.1	[0, 0.264686]	FALSE

Confidence Interval

Parameter: Fluoride

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	0.1325
Std Dev	0.0369362
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.09335, 0.17165]	0.1325	FALSE
95%	1.89458	[0.107759, 0.157241]	0.1325	**TRUE**

Compliance Locations

Location	**MW-1**
Mean	0.15125
Std Dev	0.0372012
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.111819, 0.190681]	0.15125	**TRUE**
95%	1.89458	[0.126331, 0.176169]	0.15125	**TRUE**

Location	**MW-2**
Mean	0.5175
Std Dev	0.804501
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[-0.335219, 1.37022]	0.5175	FALSE
95%	1.89458	[-0.0213822, 1.05638]	0.5175	FALSE

Location	**MW-3**
Mean	0.5125
Std Dev	0.803328
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[-0.338975, 1.36398]	0.5125	FALSE
95%	1.89458	[-0.0255966, 1.0506]	0.5125	FALSE

Location	**MW-4**
Mean	0.3775
Std Dev	0.0702546
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.303035, 0.451965]	0.3775	**TRUE**
95%	1.89458	[0.330441, 0.424559]	0.3775	**TRUE**

Location	**MW-5**
Mean	0.56875
Std Dev	0.0779079
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.486173, 0.651327]	0.56875	**TRUE**
95%	1.89458	[0.516565, 0.620935]	0.56875	**TRUE**

Location	**MW-6**
Mean	0.37875
Std Dev	0.100632
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.272087, 0.485413]	0.37875	**TRUE**
95%	1.89458	[0.311343, 0.446157]	0.37875	**TRUE**

Location	**MW-7**
Mean	0.31375
Std Dev	0.0860129
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.222582, 0.404918]	0.31375	**TRUE**
95%	1.89458	[0.256136, 0.371364]	0.31375	**TRUE**

Location	**MW-8**
Mean	0.15
Std Dev	0.141421
Degrees of Freedom	7
Comparison Level	**0.1**
Untransformed Comp. Level	0.1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.00010254, 0.299897]	0.15	FALSE
95%	1.89458	[0.0552711, 0.244729]	0.15	FALSE

Sen's Slope Analysis

Parameter: Fluoride
Location: MW-4

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
0.28 (10/15/2015)	0.51 (8/12/2015)	(0.28 - 0.51)/(2 - 1)	-0.23
0.34 (11/19/2015)	0.51 (8/12/2015)	(0.34 - 0.51)/(3 - 1)	-0.085
0.35 (1/4/2016)	0.51 (8/12/2015)	(0.35 - 0.51)/(4 - 1)	-0.0533333
0.36 (2/16/2016)	0.51 (8/12/2015)	(0.36 - 0.51)/(5 - 1)	-0.0375
0.42 (4/7/2016)	0.51 (8/12/2015)	(0.42 - 0.51)/(6 - 1)	-0.018
0.42 (5/25/2016)	0.51 (8/12/2015)	(0.42 - 0.51)/(7 - 1)	-0.015
0.34 (7/13/2016)	0.51 (8/12/2015)	(0.34 - 0.51)/(8 - 1)	-0.0242857
0.34 (11/19/2015)	0.28 (10/15/2015)	(0.34 - 0.28)/(3 - 2)	0.06
0.35 (1/4/2016)	0.28 (10/15/2015)	(0.35 - 0.28)/(4 - 2)	0.035
0.36 (2/16/2016)	0.28 (10/15/2015)	(0.36 - 0.28)/(5 - 2)	0.0266667
0.42 (4/7/2016)	0.28 (10/15/2015)	(0.42 - 0.28)/(6 - 2)	0.035
0.42 (5/25/2016)	0.28 (10/15/2015)	(0.42 - 0.28)/(7 - 2)	0.028
0.34 (7/13/2016)	0.28 (10/15/2015)	(0.34 - 0.28)/(8 - 2)	0.01
0.35 (1/4/2016)	0.34 (11/19/2015)	(0.35 - 0.34)/(4 - 3)	0.01
0.36 (2/16/2016)	0.34 (11/19/2015)	(0.36 - 0.34)/(5 - 3)	0.01
0.42 (4/7/2016)	0.34 (11/19/2015)	(0.42 - 0.34)/(6 - 3)	0.0266667
0.42 (5/25/2016)	0.34 (11/19/2015)	(0.42 - 0.34)/(7 - 3)	0.02
0.34 (7/13/2016)	0.34 (11/19/2015)	(0.34 - 0.34)/(8 - 3)	0
0.36 (2/16/2016)	0.35 (1/4/2016)	(0.36 - 0.35)/(5 - 4)	0.01
0.42 (4/7/2016)	0.35 (1/4/2016)	(0.42 - 0.35)/(6 - 4)	0.035
0.42 (5/25/2016)	0.35 (1/4/2016)	(0.42 - 0.35)/(7 - 4)	0.0233333
0.34 (7/13/2016)	0.35 (1/4/2016)	(0.34 - 0.35)/(8 - 4)	-0.0025
0.42 (4/7/2016)	0.36 (2/16/2016)	(0.42 - 0.36)/(6 - 5)	0.06
0.42 (5/25/2016)	0.36 (2/16/2016)	(0.42 - 0.36)/(7 - 5)	0.03
0.34 (7/13/2016)	0.36 (2/16/2016)	(0.34 - 0.36)/(8 - 5)	-0.00666667
0.42 (5/25/2016)	0.42 (4/7/2016)	(0.42 - 0.42)/(7 - 6)	0
0.34 (7/13/2016)	0.42 (4/7/2016)	(0.34 - 0.42)/(8 - 6)	-0.04
0.34 (7/13/2016)	0.42 (5/25/2016)	(0.34 - 0.42)/(8 - 7)	-0.08

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.23
2	-0.085

3	-0.08
4	-0.0533333
5	-0.04
6	-0.0375
7	-0.0242857
8	-0.018
9	-0.015
10	-0.00666667
11	-0.0025
12	0
13	0
14	0.01
15	0.01
16	0.01
17	0.01
18	0.02
19	0.0233333
20	0.0266667
21	0.0266667
22	0.028
23	0.03
24	0.035
25	0.035
26	0.035
27	0.06
28	0.06

Sen's Estimator (Median Q) is 0.01

Tied Group	Value	Members
1	0.34	2
2	0.42	2

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/4/2016	1
2/16/2016	1
4/7/2016	1
5/25/2016	1
7/13/2016	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 1176
b = 3024

c = 112
Group Variance = 63.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.0901
M1 = (28 - 13.0901)/2.0 = 7.45495
M2 = (28 + 13.0901)/2.0 + 1 = 21.5451
Lower limit is -0.0242857 = Q(7)
Upper limit is 0.028 = Q(22)
-0.0242857 < 0 < 0.028 indicating no trend in data.

Sen's Slope Analysis

Parameter: Fluoride
Location: MW-5

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
0.59 (10/15/2015)	0.74 (8/12/2015)	(0.59 - 0.74)/(2 - 1)	-0.15
0.59 (11/18/2015)	0.74 (8/12/2015)	(0.59 - 0.74)/(3 - 1)	-0.075
0.56 (1/4/2016)	0.74 (8/12/2015)	(0.56 - 0.74)/(4 - 1)	-0.06
0.55 (2/16/2016)	0.74 (8/12/2015)	(0.55 - 0.74)/(5 - 1)	-0.0475
0.52 (4/5/2016)	0.74 (8/12/2015)	(0.52 - 0.74)/(6 - 1)	-0.044
0.5 (5/25/2016)	0.74 (8/12/2015)	(0.5 - 0.74)/(7 - 1)	-0.04
0.5 (7/11/2016)	0.74 (8/12/2015)	(0.5 - 0.74)/(8 - 1)	-0.0342857
0.59 (11/18/2015)	0.59 (10/15/2015)	(0.59 - 0.59)/(3 - 2)	0
0.56 (1/4/2016)	0.59 (10/15/2015)	(0.56 - 0.59)/(4 - 2)	-0.015
0.55 (2/16/2016)	0.59 (10/15/2015)	(0.55 - 0.59)/(5 - 2)	-0.0133333
0.52 (4/5/2016)	0.59 (10/15/2015)	(0.52 - 0.59)/(6 - 2)	-0.0175
0.5 (5/25/2016)	0.59 (10/15/2015)	(0.5 - 0.59)/(7 - 2)	-0.018
0.5 (7/11/2016)	0.59 (10/15/2015)	(0.5 - 0.59)/(8 - 2)	-0.015
0.56 (1/4/2016)	0.59 (11/18/2015)	(0.56 - 0.59)/(4 - 3)	-0.03
0.55 (2/16/2016)	0.59 (11/18/2015)	(0.55 - 0.59)/(5 - 3)	-0.02
0.52 (4/5/2016)	0.59 (11/18/2015)	(0.52 - 0.59)/(6 - 3)	-0.0233333
0.5 (5/25/2016)	0.59 (11/18/2015)	(0.5 - 0.59)/(7 - 3)	-0.0225
0.5 (7/11/2016)	0.59 (11/18/2015)	(0.5 - 0.59)/(8 - 3)	-0.018
0.55 (2/16/2016)	0.56 (1/4/2016)	(0.55 - 0.56)/(5 - 4)	-0.01
0.52 (4/5/2016)	0.56 (1/4/2016)	(0.52 - 0.56)/(6 - 4)	-0.02
0.5 (5/25/2016)	0.56 (1/4/2016)	(0.5 - 0.56)/(7 - 4)	-0.02
0.5 (7/11/2016)	0.56 (1/4/2016)	(0.5 - 0.56)/(8 - 4)	-0.015
0.52 (4/5/2016)	0.55 (2/16/2016)	(0.52 - 0.55)/(6 - 5)	-0.03
0.5 (5/25/2016)	0.55 (2/16/2016)	(0.5 - 0.55)/(7 - 5)	-0.025
0.5 (7/11/2016)	0.55 (2/16/2016)	(0.5 - 0.55)/(8 - 5)	-0.0166667
0.5 (5/25/2016)	0.52 (4/5/2016)	(0.5 - 0.52)/(7 - 6)	-0.02
0.5 (7/11/2016)	0.52 (4/5/2016)	(0.5 - 0.52)/(8 - 6)	-0.01
0.5 (7/11/2016)	0.5 (5/25/2016)	(0.5 - 0.5)/(8 - 7)	0

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.15
2	-0.075

3	-0.06
4	-0.0475
5	-0.044
6	-0.04
7	-0.0342857
8	-0.03
9	-0.03
10	-0.025
11	-0.0233333
12	-0.0225
13	-0.02
14	-0.02
15	-0.02
16	-0.02
17	-0.018
18	-0.018
19	-0.0175
20	-0.0166667
21	-0.015
22	-0.015
23	-0.015
24	-0.0133333
25	-0.01
26	-0.01
27	0
28	0

Sen's Estimator (Median Q) is -0.02

Tied Group	Value	Members
1	0.59	2
2	0.5	2

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/18/2015	1
1/4/2016	1
2/16/2016	1
4/5/2016	1
5/25/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 1176
b = 3024

c = 112
Group Variance = 63.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.0901
M1 = (28 - 13.0901)/2.0 = 7.45495
M2 = (28 + 13.0901)/2.0 + 1 = 21.5451
Lower limit is -0.0342857 = Q(7)
Upper limit is -0.015 = Q(22)
-0.015 < 0 indicating a downward trend in data.

Sen's Slope Analysis

Parameter: Fluoride
Location: MW-6

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
0.45 (10/19/2015)	0.49 J (8/12/2015)	(0.45 - 0.49)/(2 - 1)	-0.04
0.39 (11/20/2015)	0.49 J (8/12/2015)	(0.39 - 0.49)/(3 - 1)	-0.05
0.41 (1/5/2016)	0.49 J (8/12/2015)	(0.41 - 0.49)/(4 - 1)	-0.0266667
0.34 (2/17/2016)	0.49 J (8/12/2015)	(0.34 - 0.49)/(5 - 1)	-0.0375
0.18 (4/5/2016)	0.49 J (8/12/2015)	(0.18 - 0.49)/(6 - 1)	-0.062
0.46 (5/26/2016)	0.49 J (8/12/2015)	(0.46 - 0.49)/(7 - 1)	-0.005
0.31 (7/11/2016)	0.49 J (8/12/2015)	(0.31 - 0.49)/(8 - 1)	-0.0257143
0.39 (11/20/2015)	0.45 (10/19/2015)	(0.39 - 0.45)/(3 - 2)	-0.06
0.41 (1/5/2016)	0.45 (10/19/2015)	(0.41 - 0.45)/(4 - 2)	-0.02
0.34 (2/17/2016)	0.45 (10/19/2015)	(0.34 - 0.45)/(5 - 2)	-0.0366667
0.18 (4/5/2016)	0.45 (10/19/2015)	(0.18 - 0.45)/(6 - 2)	-0.0675
0.46 (5/26/2016)	0.45 (10/19/2015)	(0.46 - 0.45)/(7 - 2)	0.002
0.31 (7/11/2016)	0.45 (10/19/2015)	(0.31 - 0.45)/(8 - 2)	-0.0233333
0.41 (1/5/2016)	0.39 (11/20/2015)	(0.41 - 0.39)/(4 - 3)	0.02
0.34 (2/17/2016)	0.39 (11/20/2015)	(0.34 - 0.39)/(5 - 3)	-0.025
0.18 (4/5/2016)	0.39 (11/20/2015)	(0.18 - 0.39)/(6 - 3)	-0.07
0.46 (5/26/2016)	0.39 (11/20/2015)	(0.46 - 0.39)/(7 - 3)	0.0175
0.31 (7/11/2016)	0.39 (11/20/2015)	(0.31 - 0.39)/(8 - 3)	-0.016
0.34 (2/17/2016)	0.41 (1/5/2016)	(0.34 - 0.41)/(5 - 4)	-0.07
0.18 (4/5/2016)	0.41 (1/5/2016)	(0.18 - 0.41)/(6 - 4)	-0.115
0.46 (5/26/2016)	0.41 (1/5/2016)	(0.46 - 0.41)/(7 - 4)	0.0166667
0.31 (7/11/2016)	0.41 (1/5/2016)	(0.31 - 0.41)/(8 - 4)	-0.025
0.18 (4/5/2016)	0.34 (2/17/2016)	(0.18 - 0.34)/(6 - 5)	-0.16
0.46 (5/26/2016)	0.34 (2/17/2016)	(0.46 - 0.34)/(7 - 5)	0.06
0.31 (7/11/2016)	0.34 (2/17/2016)	(0.31 - 0.34)/(8 - 5)	-0.01
0.46 (5/26/2016)	0.18 (4/5/2016)	(0.46 - 0.18)/(7 - 6)	0.28
0.31 (7/11/2016)	0.18 (4/5/2016)	(0.31 - 0.18)/(8 - 6)	0.065
0.31 (7/11/2016)	0.46 (5/26/2016)	(0.31 - 0.46)/(8 - 7)	-0.15

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.16
2	-0.15

3	-0.115
4	-0.07
5	-0.07
6	-0.0675
7	-0.062
8	-0.06
9	-0.05
10	-0.04
11	-0.0375
12	-0.0366667
13	-0.0266667
14	-0.0257143
15	-0.025
16	-0.025
17	-0.0233333
18	-0.02
19	-0.016
20	-0.01
21	-0.005
22	0.002
23	0.0166667
24	0.0175
25	0.02
26	0.06
27	0.065
28	0.28

Sen's Estimator (Median Q) is -0.0253571

Time Period	Observations
8/12/2015	1
10/19/2015	1
11/20/2015	1
1/5/2016	1
2/17/2016	1
4/5/2016	1
5/26/2016	1
7/11/2016	1

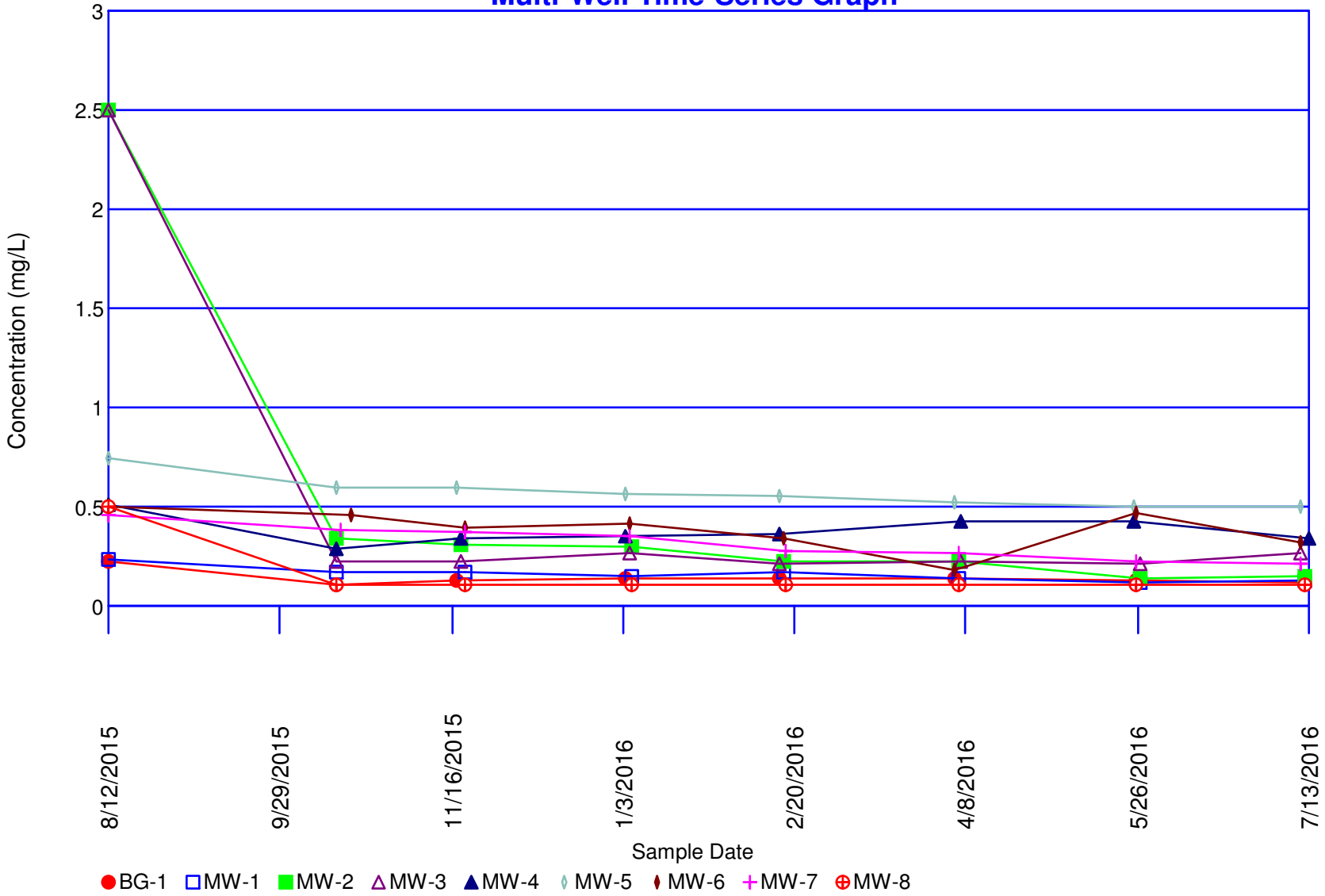
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.062 = Q(7)
Upper limit is 0.002 = Q(22)
-0.062 < 0 < 0.002 indicating no trend in data.

Fluoride

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Lithium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 63
Total Non-Detect: 1
Percent Non-Detects: 1.5873%
Total Background Measurements: 7
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	7	0 (0%)	10/15/2015	14.9	14.9
			11/18/2015	12.1	12.1
			1/4/2016	15	15
			2/16/2016	17.1	17.1
			4/5/2016	36.8	36.8
			5/26/2016	23.5	23.5
			7/12/2016	23.8	23.8

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	7	0 (0%)	10/15/2015	20.9	20.9
			11/20/2015	23.7	23.7
			1/6/2016	30.1	30.1
			2/17/2016	19.2	19.2
			4/6/2016	28.4	28.4
			5/27/2016	27.5	27.5
			7/12/2016	32.8	32.8
MW-2	7	0 (0%)	10/15/2015	34	34
			11/19/2015	53.1	53.1
			1/6/2016	144	144
			2/17/2016	88.4	88.4
			4/6/2016	117	117
			5/27/2016	350	350
			7/12/2016	356	356
MW-3	7	0 (0%)	10/15/2015	70.4	70.4
			11/19/2015	128	128
			1/5/2016	65.4	65.4
			2/16/2016	75.5	75.5
			4/7/2016	217	217
			5/27/2016	102	102
			7/11/2016	73.2	73.2
MW-4	7	1 (14.2857%)	10/15/2015	20.1	20.1
			11/19/2015	20	20
			1/4/2016	23.2	23.2

			2/16/2016	22.8	22.8
			4/7/2016	18.3	18.3
			5/25/2016	15.8	15.8
			7/13/2016	ND<0.5 U	ND<0.5 U
MW-5	7	0 (0%)	10/15/2015	7.5	7.5
			11/18/2015	7.4	7.4
			1/4/2016	6.4	6.4
			2/16/2016	6.3	6.3
			4/5/2016	9.7	9.7
			5/25/2016	8.9	8.9
			7/11/2016	9.3	9.3
MW-8	7	0 (0%)	10/15/2015	27.4	27.4
			11/20/2015	50.1	50.1
			1/6/2016	39.6	39.6
			2/18/2016	33.4	33.4
			4/6/2016	37.6	37.6
			5/26/2016	29.7	29.7
			7/12/2016	31.2	31.2
MW-7	7	0 (0%)	10/16/2015	23.5	23.5
			11/20/2015	31.1	31.1
			1/5/2016	21.7	21.7
			2/18/2016	17.7	17.7
			4/6/2016	20.7	20.7
			5/26/2016	21.5	21.5
			7/11/2016	23	23
MW-6	7	0 (0%)	10/19/2015	43.1	43.1
			11/20/2015	60.5	60.5
			1/5/2016	55.8	55.8
			2/17/2016	37.1	37.1
			4/5/2016	41.2	41.2
			5/26/2016	30.6	30.6
			7/11/2016	31.7	31.7

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Lithium

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 48.9556

10 most extreme of 63 measurements

by order of magnitude difference from the mean

1	7/12/2016	MW-2	356	307.044
2	5/27/2016	MW-2	350	301.044
3	4/7/2016	MW-3	217	168.044
4	1/6/2016	MW-2	144	95.0444
5	11/19/2015	MW-3	128	79.0444
6	4/6/2016	MW-2	117	68.0444
7	5/27/2016	MW-3	102	53.0444
8	7/13/2016	MW-4	ND<0.5 U	-48.4556
9	2/16/2016	MW-5	6.3	-42.6556
10	1/4/2016	MW-5	6.4	-42.5556

Iteration i = 9

Mean of 54 measurements = 30.8037
Std Dev = 18.7112
x(i+1) = 6.4 from measurement 1/4/2016 from location MW-5
Rosner Statistic R = |6.4 - 30.8037|/18.7112 = 1.30423
Lambda(63, 10, 0.05) = 3.161
1.30423 < 3.161 -- No outliers detected for i = 9

Iteration i = 8

Mean of 55 measurements = 30.3582
Std Dev = 18.8293
x(i+1) = 6.3 from measurement 2/16/2016 from location MW-5
Rosner Statistic R = |6.3 - 30.3582|/18.8293 = 1.2777
Lambda(63, 9, 0.05) = 3.167
1.2777 < 3.167 -- No outliers detected for i = 8

Iteration i = 7

Mean of 56 measurements = 29.825
Std Dev = 19.0792
x(i+1) = 0.5 from measurement 7/13/2016 from location MW-4
Rosner Statistic R = |0.5 - 29.825|/19.0792 = 1.53701
Lambda(63, 8, 0.05) = 3.173
1.53701 < 3.173 -- No outliers detected for i = 7

Iteration i = 6

Mean of 57 measurements = 31.0912

Std Dev = 21.1874
x(i+1) = 102 from measurement 5/27/2016 from location MW-3
Rosner Statistic R = |102 - 31.0912|/21.1874 = 3.34674
Lambda(63, 7, 0.05) = 3.179
3.34674 > 3.179 -- Measurement 5/27/2016 for location MW-3 is an outlier

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Iteration i = 5

Mean of 58 measurements = 32.5724
Std Dev = 23.8386
x(i+1) = 117 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |117 - 32.5724|/23.8386 = 3.54164
Lambda(63, 6, 0.05) = 3.185
Measurement 4/6/2016 for location MW-2 is an outlier

Iteration i = 4

Mean of 59 measurements = 34.1898
Std Dev = 26.6988
x(i+1) = 128 from measurement 11/19/2015 from location MW-3
Rosner Statistic R = |128 - 34.1898|/26.6988 = 3.51365
Lambda(63, 5, 0.05) = 3.191
Measurement 11/19/2015 for location MW-3 is an outlier

Iteration i = 3

Mean of 60 measurements = 36.02
Std Dev = 30.0286
x(i+1) = 144 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |144 - 36.02|/30.0286 = 3.59591
Lambda(63, 4, 0.05) = 3.198
Measurement 1/6/2016 for location MW-2 is an outlier

Iteration i = 2

Mean of 61 measurements = 38.9869
Std Dev = 37.7311
x(i+1) = 217 from measurement 4/7/2016 from location MW-3
Rosner Statistic R = |217 - 38.9869|/37.7311 = 4.71795
Lambda(63, 3, 0.05) = 3.208
Measurement 4/7/2016 for location MW-3 is an outlier

Iteration i = 1

Mean of 62 measurements = 44.0032
Std Dev = 54.41
x(i+1) = 350 from measurement 5/27/2016 from location MW-2
Rosner Statistic R = |350 - 44.0032|/54.41 = 5.62391
Lambda(63, 2, 0.05) = 3.208
Measurement 5/27/2016 for location MW-2 is an outlier

Iteration i = 0

Mean of 63 measurements = 48.9556

Std Dev = 66.7668

x(i+1) = 356 from measurement 7/12/2016 from location MW-2

Rosner Statistic R = |356 - 48.9556|/66.7668 = 4.59876

Lambda(63, 1, 0.05) = 3.218

Measurement 7/12/2016 for location MW-2 is an outlier

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Lithium

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 7
Background Mean = 20.4571
Background Std Dev = 8.4587

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 7 (background observations) - 1
t(0.99375, 7) = 3.56624

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	32.8	[0, 52.7057]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**356**	**[0, 52.7057]**	**TRUE**

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**73.2**	**[0, 52.7057]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	0.5	[0, 52.7057]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	9.3	[0, 52.7057]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	31.7	[0, 52.7057]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	23	[0, 52.7057]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	31.2	[0, 52.7057]	FALSE

Confidence Interval

Parameter: Lithium

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	20.4571
Std Dev	8.4587
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	3.14267	[10.4098, 30.5045]	20.4571	**TRUE**
95%	1.94318	[14.2446, 26.6697]	20.4571	**TRUE**

Compliance Locations

Location	**MW-1**
Mean	26.0857
Std Dev	4.97575
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	3.14267	[20.1754, 31.996]	26.0857	**TRUE**
95%	1.94318	[22.4313, 29.7402]	26.0857	**TRUE**

Location	**MW-2**
Mean	163.214
Std Dev	134.771
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	3.14267	[3.13138, 323.297]	163.214	**TRUE**
95%	1.94318	[64.2315, 262.197]	163.214	**TRUE**

Location	**MW-3**
Mean	104.5
Std Dev	54.3554
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	3.14267	[39.9357, 169.064]	104.5	**TRUE**
95%	1.94318	[64.5785, 144.422]	104.5	**TRUE**

Location	**MW-4**
Mean	17.2429
Std Dev	7.80659
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	3.14267	[7.97006, 26.5157]	17.2429	**TRUE**
95%	1.94318	[11.5093, 22.9764]	17.2429	**TRUE**

Location	MW-5
Mean	7.92857
Std Dev	1.37927
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[6.29025, 9.56689]	7.92857	TRUE
95%	1.94318	[6.91556, 8.94158]	7.92857	TRUE

Location	MW-6
Mean	42.8571
Std Dev	11.4707
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[29.2321, 56.4822]	42.8571	TRUE
95%	1.94318	[34.4325, 51.2818]	42.8571	TRUE

Location	MW-7
Mean	22.7429
Std Dev	4.13757
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[17.8282, 27.6575]	22.7429	TRUE
95%	1.94318	[19.704, 25.7817]	22.7429	TRUE

Location	MW-8
Mean	35.5714
Std Dev	7.70816
Degrees of Freedom	6
Comparison Level	**0.5**
Untransformed Comp. Level	0.5

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[26.4155, 44.7273]	35.5714	TRUE
95%	1.94318	[29.9101, 41.2327]	35.5714	TRUE

Sen's Slope Analysis

Parameter: Lithium
Location: MW-2

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
53.1 (11/19/2015)	34 (10/15/2015)	(53.1 - 34)/(2 - 1)	19.1
144 (1/6/2016)	34 (10/15/2015)	(144 - 34)/(3 - 1)	55
88.4 (2/17/2016)	34 (10/15/2015)	(88.4 - 34)/(4 - 1)	18.1333
117 (4/6/2016)	34 (10/15/2015)	(117 - 34)/(5 - 1)	20.75
350 (5/27/2016)	34 (10/15/2015)	(350 - 34)/(6 - 1)	63.2
356 (7/12/2016)	34 (10/15/2015)	(356 - 34)/(7 - 1)	53.6667
144 (1/6/2016)	53.1 (11/19/2015)	(144 - 53.1)/(3 - 2)	90.9
88.4 (2/17/2016)	53.1 (11/19/2015)	(88.4 - 53.1)/(4 - 2)	17.65
117 (4/6/2016)	53.1 (11/19/2015)	(117 - 53.1)/(5 - 2)	21.3
350 (5/27/2016)	53.1 (11/19/2015)	(350 - 53.1)/(6 - 2)	74.225
356 (7/12/2016)	53.1 (11/19/2015)	(356 - 53.1)/(7 - 2)	60.58
88.4 (2/17/2016)	144 (1/6/2016)	(88.4 - 144)/(4 - 3)	-55.6
117 (4/6/2016)	144 (1/6/2016)	(117 - 144)/(5 - 3)	-13.5
350 (5/27/2016)	144 (1/6/2016)	(350 - 144)/(6 - 3)	68.6667
356 (7/12/2016)	144 (1/6/2016)	(356 - 144)/(7 - 3)	53
117 (4/6/2016)	88.4 (2/17/2016)	(117 - 88.4)/(5 - 4)	28.6
350 (5/27/2016)	88.4 (2/17/2016)	(350 - 88.4)/(6 - 4)	130.8
356 (7/12/2016)	88.4 (2/17/2016)	(356 - 88.4)/(7 - 4)	89.2
350 (5/27/2016)	117 (4/6/2016)	(350 - 117)/(6 - 5)	233
356 (7/12/2016)	117 (4/6/2016)	(356 - 117)/(7 - 5)	119.5
356 (7/12/2016)	350 (5/27/2016)	(356 - 350)/(7 - 6)	6

Number of Q values = 21

Ordered Q Values

n	Q
1	-55.6
2	-13.5
3	6
4	17.65
5	18.1333
6	19.1
7	20.75
8	21.3
9	28.6
10	53

11	53.6667
12	55
13	60.58
14	63.2
15	68.6667
16	74.225
17	89.2
18	90.9
19	119.5
20	130.8
21	233

Sen's Estimator (Median Q) is 53.6667

Time Period	Observations
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02401
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is 18.1333 = Q(5)
Upper limit is 89.2 = Q(17)
18.1333 > 0 indicating an upward trend in data.

Sen's Slope Analysis

Parameter: Lithium
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
128 (11/19/2015)	70.4 (10/15/2015)	(128 - 70.4)/(2 - 1)	57.6
65.4 (1/5/2016)	70.4 (10/15/2015)	(65.4 - 70.4)/(3 - 1)	-2.5
75.5 (2/16/2016)	70.4 (10/15/2015)	(75.5 - 70.4)/(4 - 1)	1.7
217 (4/7/2016)	70.4 (10/15/2015)	(217 - 70.4)/(5 - 1)	36.65
102 (5/27/2016)	70.4 (10/15/2015)	(102 - 70.4)/(6 - 1)	6.32
73.2 (7/11/2016)	70.4 (10/15/2015)	(73.2 - 70.4)/(7 - 1)	0.466667
65.4 (1/5/2016)	128 (11/19/2015)	(65.4 - 128)/(3 - 2)	-62.6
75.5 (2/16/2016)	128 (11/19/2015)	(75.5 - 128)/(4 - 2)	-26.25
217 (4/7/2016)	128 (11/19/2015)	(217 - 128)/(5 - 2)	29.6667
102 (5/27/2016)	128 (11/19/2015)	(102 - 128)/(6 - 2)	-6.5
73.2 (7/11/2016)	128 (11/19/2015)	(73.2 - 128)/(7 - 2)	-10.96
75.5 (2/16/2016)	65.4 (1/5/2016)	(75.5 - 65.4)/(4 - 3)	10.1
217 (4/7/2016)	65.4 (1/5/2016)	(217 - 65.4)/(5 - 3)	75.8
102 (5/27/2016)	65.4 (1/5/2016)	(102 - 65.4)/(6 - 3)	12.2
73.2 (7/11/2016)	65.4 (1/5/2016)	(73.2 - 65.4)/(7 - 3)	1.95
217 (4/7/2016)	75.5 (2/16/2016)	(217 - 75.5)/(5 - 4)	141.5
102 (5/27/2016)	75.5 (2/16/2016)	(102 - 75.5)/(6 - 4)	13.25
73.2 (7/11/2016)	75.5 (2/16/2016)	(73.2 - 75.5)/(7 - 4)	-0.766667
102 (5/27/2016)	217 (4/7/2016)	(102 - 217)/(6 - 5)	-115
73.2 (7/11/2016)	217 (4/7/2016)	(73.2 - 217)/(7 - 5)	-71.9
73.2 (7/11/2016)	102 (5/27/2016)	(73.2 - 102)/(7 - 6)	-28.8

Number of Q values = 21

Ordered Q Values

n	Q
1	-115
2	-71.9
3	-62.6
4	-28.8
5	-26.25
6	-10.96
7	-6.5
8	-2.5
9	-0.766667
10	0.466667

11	1.7
12	1.95
13	6.32
14	10.1
15	12.2
16	13.25
17	29.6667
18	36.65
19	57.6
20	75.8
21	141.5

Sen's Estimator (Median Q) is 1.7

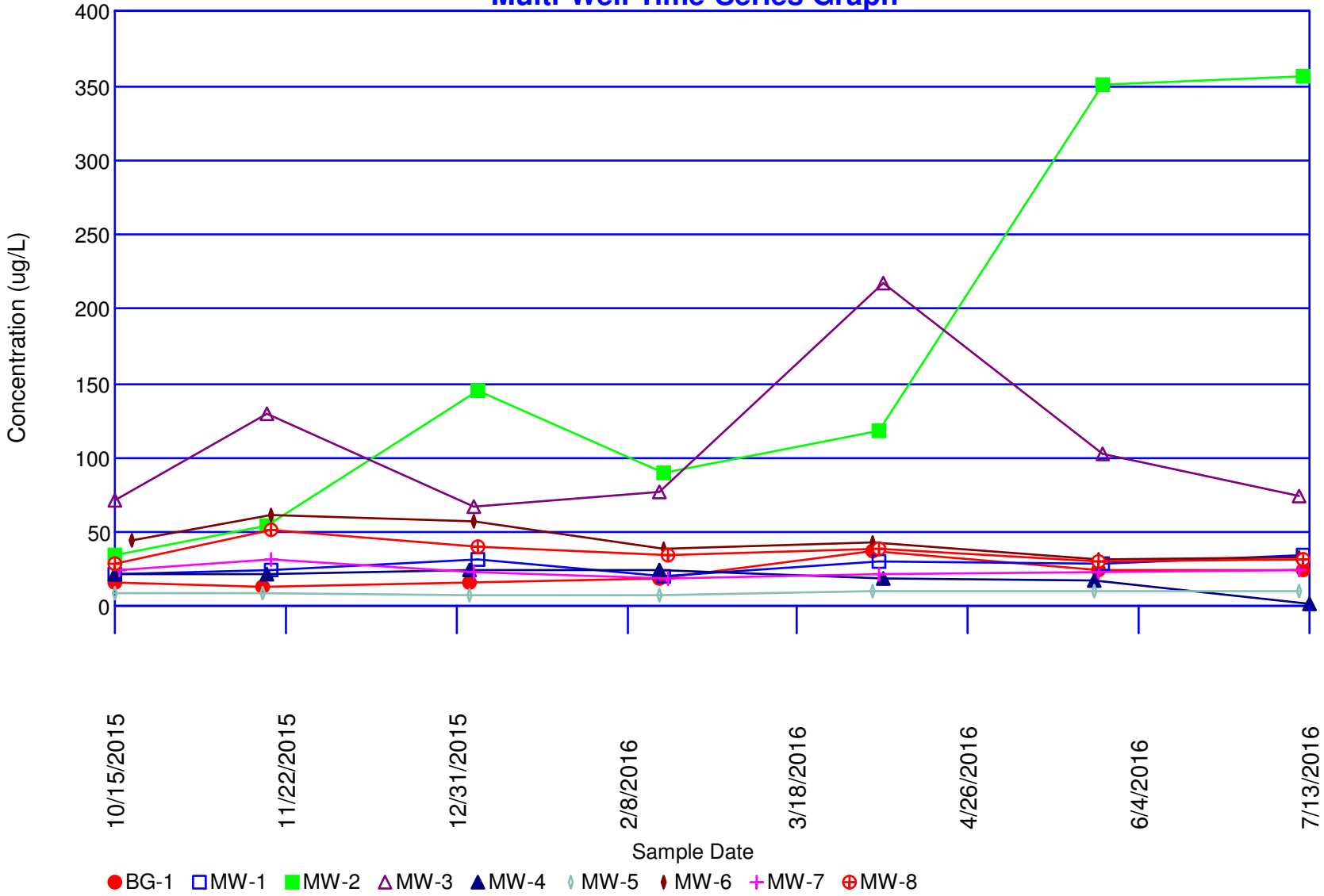
Time Period	Observations
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02401
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is -26.25 = Q(5)
Upper limit is 29.6667 = Q(17)
-26.25 < 0 < 29.6667 indicating no trend in data.

Lithium

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 46
Percent Non-Detects: 63.8889%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	6 (75%)	8/12/2015	0.55 J	0.55 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	6.8	6.8
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	7 (87.5%)	8/12/2015	1.3 J	1.3 J
			10/15/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/6/2016	ND<5 U	ND<5 U
			2/17/2016	ND<5 U	ND<5 U
			4/6/2016	ND<5 U	ND<5 U
			5/27/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U
MW-2	8	0 (0%)	8/12/2015	11	11
			10/15/2015	20.6	20.6
			11/19/2015	21.1	21.1
			1/6/2016	18.1	18.1
			2/17/2016	19.1	19.1
			4/6/2016	9.5	9.5
			5/27/2016	10.1	10.1
			7/12/2016	10.8	10.8
MW-3	8	0 (0%)	8/12/2015	21	21
			10/15/2015	10.5	10.5
			11/19/2015	10.4	10.4
			1/5/2016	10.9	10.9
			2/16/2016	13.8	13.8
			4/7/2016	8.6	8.6
			5/27/2016	10.2	10.2
			7/11/2016	12	12

MW-4	8	7 (87.5%)	8/12/2015	1.6 J	1.6 J
			10/15/2015	ND<5 U	ND<5 U
			11/19/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/7/2016	ND<5 U	ND<5 U
			5/25/2016	ND<5 U	ND<5 U
			7/13/2016	ND<5 U	ND<5 U
MW-5	8	7 (87.5%)	8/12/2015	1.6 J	1.6 J
			10/15/2015	ND<5 U	ND<5 U
			11/18/2015	ND<5 U	ND<5 U
			1/4/2016	ND<5 U	ND<5 U
			2/16/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/25/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-6	8	6 (75%)	8/12/2015	1.4 J	1.4 J
			10/19/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/5/2016	5.4	5.4
			2/17/2016	ND<5 U	ND<5 U
			4/5/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-7	8	6 (75%)	8/12/2015	3.6 J	3.6 J
			10/16/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/5/2016	6.4	6.4
			2/18/2016	ND<5 U	ND<5 U
			4/6/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/11/2016	ND<5 U	ND<5 U
MW-8	8	7 (87.5%)	8/12/2015	ND<10 U	ND<10 U
			10/15/2015	ND<5 U	ND<5 U
			11/20/2015	ND<5 U	ND<5 U
			1/6/2016	ND<5 U	ND<5 U
			2/18/2016	5.6	5.6
			4/6/2016	ND<5 U	ND<5 U
			5/26/2016	ND<5 U	ND<5 U
			7/12/2016	ND<5 U	ND<5 U

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Molybdenum

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 6.76319

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	11/19/2015	MW-2	21.1	14.3368
2	8/12/2015	MW-3	21	14.2368
3	10/15/2015	MW-2	20.6	13.8368
4	2/17/2016	MW-2	19.1	12.3368
5	1/6/2016	MW-2	18.1	11.3368
6	2/16/2016	MW-3	13.8	7.03681
7	8/12/2015	BG-1	0.55 J	-6.21319
8	8/12/2015	MW-1	1.3 J	-5.46319
9	8/12/2015	MW-6	1.4 J	-5.36319
10	7/11/2016	MW-3	12	5.23681

Iteration i = 9

Mean of 63 measurements = 5.87302
Std Dev = 2.22487
x(i+1) = 12 from measurement 7/11/2016 from location MW-3
Rosner Statistic R = |12 - 5.87302|/2.22487 = 2.75386
Lambda(72, 10, 0.05) = 3.22
2.75386 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 5.80313
Std Dev = 2.27687
x(i+1) = 1.4 from measurement 8/12/2015 from location MW-6
Rosner Statistic R = |1.4 - 5.80313|/2.27687 = 1.93385
Lambda(72, 9, 0.05) = 3.226
1.93385 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 5.73385
Std Dev = 2.32703
x(i+1) = 1.3 from measurement 8/12/2015 from location MW-1
Rosner Statistic R = |1.3 - 5.73385|/2.32703 = 1.90536
Lambda(72, 8, 0.05) = 3.232
1.90536 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 5.6553

Std Dev = 2.39561
x(i+1) = 0.55 from measurement 8/12/2015 from location BG-1
Rosner Statistic R = |0.55 - 5.6553|/2.39561 = 2.13111
Lambda(72, 7, 0.05) = 3.238
2.13111 < 3.238 -- No outliers detected for i = 6

Iteration i = 5

Mean of 67 measurements = 5.77687
Std Dev = 2.57722
x(i+1) = 13.8 from measurement 2/16/2016 from location MW-3
Rosner Statistic R = |13.8 - 5.77687|/2.57722 = 3.11309
Lambda(72, 6, 0.05) = 3.244
3.11309 < 3.244 -- No outliers detected for i = 5

Iteration i = 4

Mean of 68 measurements = 5.95809
Std Dev = 2.96246
x(i+1) = 18.1 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |18.1 - 5.95809|/2.96246 = 4.09859
Lambda(72, 5, 0.05) = 3.25
4.09859 > 3.25 -- Measurement 1/6/2016 for location MW-2 is an outlier

---

Iteration i = 3

Mean of 69 measurements = 6.14855
Std Dev = 3.33918
x(i+1) = 19.1 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |19.1 - 6.14855|/3.33918 = 3.87863
Lambda(72, 4, 0.05) = 3.25
Measurement 2/17/2016 for location MW-2 is an outlier

Iteration i = 2

Mean of 70 measurements = 6.355
Std Dev = 3.73792
x(i+1) = 20.6 from measurement 10/15/2015 from location MW-2
Rosner Statistic R = |20.6 - 6.355|/3.73792 = 3.81094
Lambda(72, 3, 0.05) = 3.26
Measurement 10/15/2015 for location MW-2 is an outlier

Iteration i = 1

Mean of 71 measurements = 6.56127
Std Dev = 4.09795
x(i+1) = 21 from measurement 8/12/2015 from location MW-3
Rosner Statistic R = |21 - 6.56127|/4.09795 = 3.5234
Lambda(72, 2, 0.05) = 3.26
Measurement 8/12/2015 for location MW-3 is an outlier

Iteration i = 0

Mean of 72 measurements = 6.76319

Std Dev = 4.41503

x(i+1) = 21.1 from measurement 11/19/2015 from location MW-2

Rosner Statistic R = |21.1 - 6.76319|/4.41503 = 3.24727

Lambda(72, 1, 0.05) = 3.27

Measurement 11/19/2015 for location MW-2 is an outlier

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Molybdenum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 63.8889%
Number of comparisons = 8
Future Samples (k) = 8
Recent Dates = 1
Background Measurements (n) = 8
Maximum Background Value = 6.8
Confidence Level = 50%
False Positive Rate = 50%

Location	Date	Count	Mean	Significant
MW-1	7/12/2016	1	5	FALSE
MW-2	**7/12/2016**	**1**	**10.8**	**TRUE**
MW-3	**7/11/2016**	**1**	**12**	**TRUE**
MW-4	7/13/2016	1	5	FALSE
MW-5	7/11/2016	1	5	FALSE
MW-6	7/11/2016	1	5	FALSE
MW-7	7/11/2016	1	5	FALSE
MW-8	7/12/2016	1	5	FALSE

Non-Parametric Confidence Interval

Parameter: Molybdenum
Well: MW-2
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-2	4/6/2016	9.5	1
MW-2	5/27/2016	10.1	2
MW-2	7/12/2016	10.8	3
MW-2	8/12/2015	11	4
MW-2	1/6/2016	18.1	5
MW-2	2/17/2016	19.1	6
MW-2	10/15/2015	20.6	7
MW-2	11/19/2015	21.1	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 21.1
Lower Confidence Inverval X(1) = 9.5
9.5 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Molybdenum
Well: MW-3
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

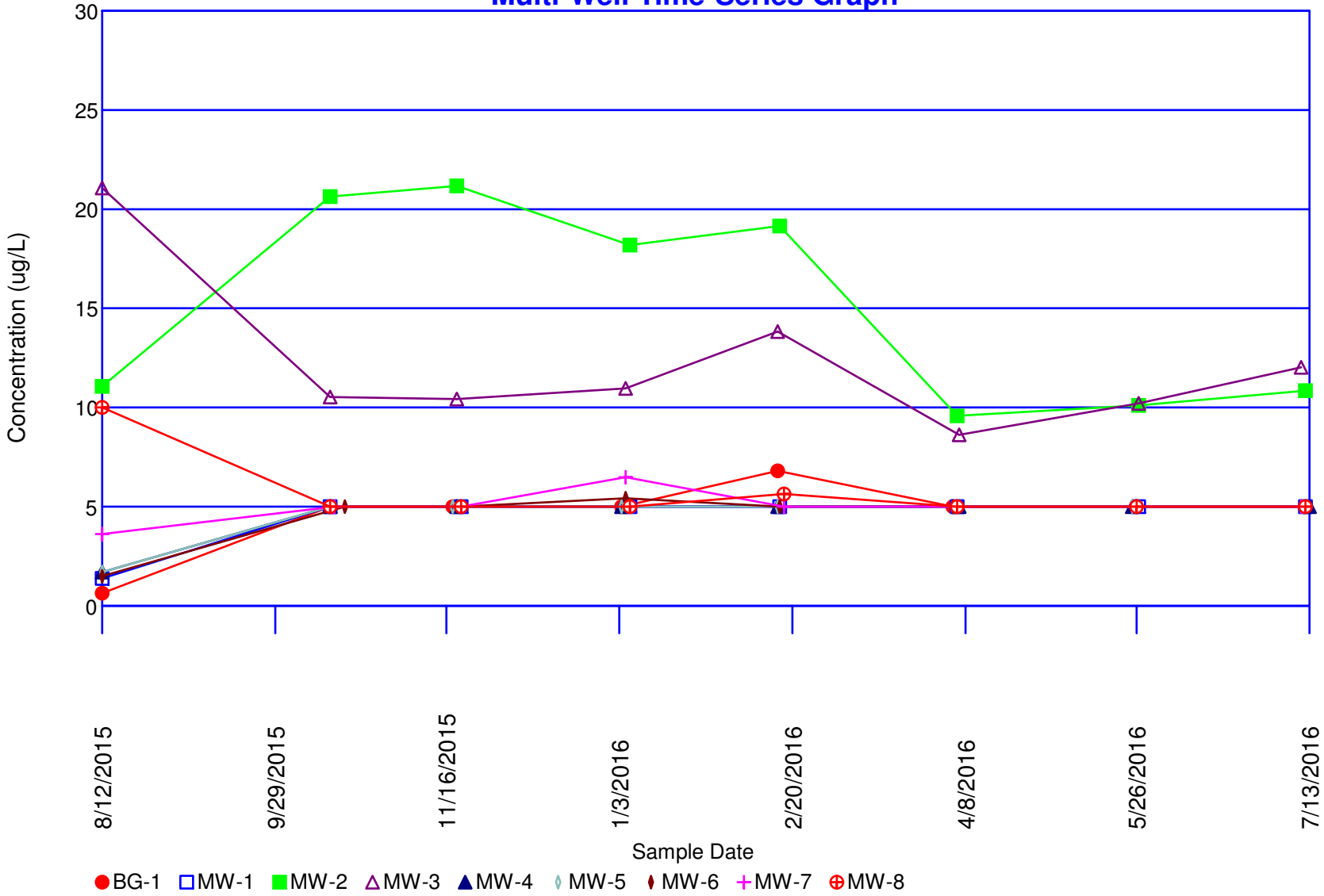
Point	Date	Value	Rank
MW-3	4/7/2016	8.6	1
MW-3	5/27/2016	10.2	2
MW-3	11/19/2015	10.4	3
MW-3	10/15/2015	10.5	4
MW-3	1/5/2016	10.9	5
MW-3	7/11/2016	12	6
MW-3	2/16/2016	13.8	7
MW-3	8/12/2015	21	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 21
Lower Confidence Inverval X(1) = 8.6
8.6 > 0 Indicating Statistical Significance

Molybdenum

Multi-Well Time-Series Graph



Concentrations (S.U.)

Parameter: pH(Field)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	6.44	6.44
			10/15/2015	6.24	6.24
			11/18/2015	6.38	6.38
			1/4/2016	6.51	6.51
			2/16/2016	6.52	6.52
			4/5/2016	6.6	6.6
			5/26/2016	6.8	6.8
			7/12/2016	6.5	6.5

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	6.67	6.67
			10/15/2015	7.3	7.3
			11/20/2015	6.91	6.91
			1/6/2016	6.71	6.71
			2/17/2016	6.84	6.84
			4/6/2016	6.7	6.7
			5/27/2016	6.8	6.8
			7/12/2016	6.5	6.5
MW-2	8	0 (0%)	8/12/2015	7.89	7.89
			10/15/2015	7.7	7.7
			11/20/2015	7.6	7.6
			1/6/2016	7.95	7.95
			2/17/2016	7.63	7.63
			4/6/2016	7.6	7.6
			5/27/2016	7.9	7.9
			7/12/2016	8.5	8.5
MW-3	8	0 (0%)	8/12/2015	7.41	7.41
			10/15/2015	7.6	7.6
			11/19/2015	7.5	7.5
			1/5/2016	7.33	7.33
			2/16/2016	7.22	7.22
			4/7/2016	7.1	7.1
			5/27/2016	7.4	7.4
			7/11/2016	7.3	7.3

MW-4	8	0 (0%)	8/12/2015	6.35	6.35
			10/15/2015	6.17	6.17
			11/19/2015	6.3	6.3
			1/4/2016	6.38	6.38
			2/16/2016	6.33	6.33
			4/7/2016	6.4	6.4
			5/25/2016	6.5	6.5
			7/11/2016	6.3	6.3
MW-5	8	0 (0%)	8/12/2015	7.27	7.27
			10/15/2015	7.3	7.3
			11/18/2015	7.11	7.11
			1/4/2016	7	7
			2/16/2016	7.09	7.09
			4/5/2016	6.9	6.9
			5/25/2016	7	7
			7/11/2016	6.8	6.8
MW-6	8	0 (0%)	8/12/2015	6.61	6.61
			10/19/2015	6.22	6.22
			11/20/2015	6.64	6.64
			1/5/2016	6.67	6.67
			2/17/2016	6.35	6.35
			4/5/2016	6.4	6.4
			5/26/2016	6.4	6.4
			7/11/2016	6.4	6.4
MW-7	8	0 (0%)	8/12/2015	6.85	6.85
			10/16/2015	6.62	6.62
			11/20/2015	6.61	6.61
			1/5/2016	6.57	6.57
			2/16/2016	6.87	6.87
			4/6/2016	6.6	6.6
			5/26/2016	6.9	6.9
			7/11/2016	6.8	6.8
MW-8	8	0 (0%)	8/12/2015	7.7	7.7
			10/15/2015	7	7
			11/20/2015	6.7	6.7
			1/6/2016	6.81	6.81
			2/18/2016	6.82	6.82
			4/6/2016	6.8	6.8
			5/26/2016	7	7
			7/12/2016	6.9	6.9

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: pH(Field)

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 6.89569

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	7/12/2016	MW-2	8.5	1.60431
2	1/6/2016	MW-2	7.95	1.05431
3	5/27/2016	MW-2	7.9	1.00431
4	8/12/2015	MW-2	7.89	0.994306
5	10/15/2015	MW-2	7.7	0.804306
6	8/12/2015	MW-8	7.7	0.804306
7	2/17/2016	MW-2	7.63	0.734306
8	10/15/2015	MW-4	6.17	-0.725694
9	11/20/2015	MW-2	7.6	0.704306
10	10/15/2015	MW-3	7.6	0.704306

Iteration i = 9

Mean of 63 measurements = 6.78492
Std Dev = 0.360411
x(i+1) = 7.6 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |7.6 - 6.78492|/0.360411 = 2.26153
Lambda(72, 10, 0.05) = 3.22
2.26153 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 6.79766
Std Dev = 0.371773
x(i+1) = 7.6 from measurement 11/20/2015 from location MW-2
Rosner Statistic R = |7.6 - 6.79766|/0.371773 = 2.15816
Lambda(72, 9, 0.05) = 3.226
2.15816 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 6.788
Std Dev = 0.376983
x(i+1) = 6.17 from measurement 10/15/2015 from location MW-4
Rosner Statistic R = |6.17 - 6.788|/0.376983 = 1.63933
Lambda(72, 8, 0.05) = 3.232
1.63933 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 6.80076

Std Dev = 0.388165
x(i+1) = 7.63 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |7.63 - 6.80076|/0.388165 = 2.13632
Lambda(72, 7, 0.05) = 3.238
2.13632 < 3.238 -- No outliers detected for i = 6

Iteration i = 5
Mean of 67 measurements = 6.81418
Std Dev = 0.400572
x(i+1) = 7.7 from measurement 8/12/2015 from location MW-8
Rosner Statistic R = |7.7 - 6.81418|/0.400572 = 2.21139
Lambda(72, 6, 0.05) = 3.244
2.21139 < 3.244 -- No outliers detected for i = 5

Iteration i = 4
Mean of 68 measurements = 6.82721
Std Dev = 0.411828
x(i+1) = 7.7 from measurement 10/15/2015 from location MW-2
Rosner Statistic R = |7.7 - 6.82721|/0.411828 = 2.11932
Lambda(72, 5, 0.05) = 3.25
2.11932 < 3.25 -- No outliers detected for i = 4

Iteration i = 3
Mean of 69 measurements = 6.84261
Std Dev = 0.428344
x(i+1) = 7.89 from measurement 8/12/2015 from location MW-2
Rosner Statistic R = |7.89 - 6.84261|/0.428344 = 2.44521
Lambda(72, 4, 0.05) = 3.25
2.44521 < 3.25 -- No outliers detected for i = 3

Iteration i = 2
Mean of 70 measurements = 6.85771
Std Dev = 0.443612
x(i+1) = 7.9 from measurement 5/27/2016 from location MW-2
Rosner Statistic R = |7.9 - 6.85771|/0.443612 = 2.34954
Lambda(72, 3, 0.05) = 3.26
2.34954 < 3.26 -- No outliers detected for i = 2

Iteration i = 1
Mean of 71 measurements = 6.8731
Std Dev = 0.459113
x(i+1) = 7.95 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |7.95 - 6.8731|/0.459113 = 2.34561
Lambda(72, 2, 0.05) = 3.26
2.34561 < 3.26 -- No outliers detected for i = 1

Iteration i = 0

Mean of 72 measurements = 6.89569
Std Dev = 0.494547
x(i+1) = 8.5 from measurement 7/12/2016 from location MW-2
Rosner Statistic R = |8.5 - 6.89569|/0.494547 = 3.24399
Lambda(72, 1, 0.05) = 3.27
3.24399 < 3.27 -- No outliers detected for i = 0

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: pH(Field)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% Two-Sided Comparison

Background Samples = 8
Background Mean = 6.49875
Background Std Dev = 0.163046

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8)/2 = 99.6875 %
t is Percentile of Student's T-Test (0.95/8/2) = 0.996875
Degrees of Freedom = 8 (background observations) - 1
t(0.996875, 8) = 4.10219

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	6.5	[5.79, 7.21]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	**1**	**8.5**	**[5.79, 7.21]**	**TRUE**

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	**1**	**7.3**	**[5.79, 7.21]**	**TRUE**

Well MW-4

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.3	[5.79, 7.21]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.8	[5.79, 7.21]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.4	[5.79, 7.21]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.8	[5.79, 7.21]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	6.9	[5.79, 7.21]	FALSE

Confidence Interval

Parameter: pH(Field)

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	6.49875
Std Dev	0.163046
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.32593, 6.67157]	6.49875	TRUE
95%	1.89458	[6.38954, 6.60796]	6.49875	TRUE

Compliance Locations

Location	**MW-1**
Mean	6.80375
Std Dev	0.235611
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.55402, 7.05348]	6.80375	TRUE
95%	1.89458	[6.64593, 6.96157]	6.80375	TRUE

Location	**MW-2**
Mean	7.84625
Std Dev	0.300568
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[7.52767, 8.16483]	7.84625	TRUE
95%	1.89458	[7.64492, 8.04758]	7.84625	TRUE

Location	**MW-3**
Mean	7.3575
Std Dev	0.157185
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[7.19089, 7.52411]	7.3575	TRUE
95%	1.89458	[7.25221, 7.46279]	7.3575	TRUE

Location	**MW-4**
Mean	6.34125
Std Dev	0.0949342
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.24063, 6.44187]	6.34125	TRUE
95%	1.89458	[6.27766, 6.40484]	6.34125	TRUE

Location	**MW-5**
Mean	7.05875
Std Dev	0.171334
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.87715, 7.24035]	7.05875	**TRUE**
95%	1.89458	[6.94398, 7.17352]	7.05875	**TRUE**

Location	**MW-6**
Mean	6.46125
Std Dev	0.160128
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.29152, 6.63098]	6.46125	**TRUE**
95%	1.89458	[6.35399, 6.56851]	6.46125	**TRUE**

Location	**MW-7**
Mean	6.7275
Std Dev	0.13977
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.57935, 6.87565]	6.7275	**TRUE**
95%	1.89458	[6.63388, 6.82112]	6.7275	**TRUE**

Location	**MW-8**
Mean	6.96625
Std Dev	0.313821
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[6.63362, 7.29888]	6.96625	**TRUE**
95%	1.89458	[6.75604, 7.17646]	6.96625	**TRUE**

Sen's Slope Analysis

Parameter: pH(Field)

Location: MW-2

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.7 (10/15/2015)	7.89 (8/12/2015)	(7.7 - 7.89)/(2 - 1)	-0.19
7.6 (11/20/2015)	7.89 (8/12/2015)	(7.6 - 7.89)/(3 - 1)	-0.145
7.95 (1/6/2016)	7.89 (8/12/2015)	(7.95 - 7.89)/(4 - 1)	0.02
7.63 (2/17/2016)	7.89 (8/12/2015)	(7.63 - 7.89)/(5 - 1)	-0.065
7.6 (4/6/2016)	7.89 (8/12/2015)	(7.6 - 7.89)/(6 - 1)	-0.058
7.9 (5/27/2016)	7.89 (8/12/2015)	(7.9 - 7.89)/(7 - 1)	0.00166667
8.5 (7/12/2016)	7.89 (8/12/2015)	(8.5 - 7.89)/(8 - 1)	0.0871429
7.6 (11/20/2015)	7.7 (10/15/2015)	(7.6 - 7.7)/(3 - 2)	-0.1
7.95 (1/6/2016)	7.7 (10/15/2015)	(7.95 - 7.7)/(4 - 2)	0.125
7.63 (2/17/2016)	7.7 (10/15/2015)	(7.63 - 7.7)/(5 - 2)	-0.0233333
7.6 (4/6/2016)	7.7 (10/15/2015)	(7.6 - 7.7)/(6 - 2)	-0.025
7.9 (5/27/2016)	7.7 (10/15/2015)	(7.9 - 7.7)/(7 - 2)	0.04
8.5 (7/12/2016)	7.7 (10/15/2015)	(8.5 - 7.7)/(8 - 2)	0.133333
7.95 (1/6/2016)	7.6 (11/20/2015)	(7.95 - 7.6)/(4 - 3)	0.35
7.63 (2/17/2016)	7.6 (11/20/2015)	(7.63 - 7.6)/(5 - 3)	0.015
7.6 (4/6/2016)	7.6 (11/20/2015)	(7.6 - 7.6)/(6 - 3)	0
7.9 (5/27/2016)	7.6 (11/20/2015)	(7.9 - 7.6)/(7 - 3)	0.075
8.5 (7/12/2016)	7.6 (11/20/2015)	(8.5 - 7.6)/(8 - 3)	0.18
7.63 (2/17/2016)	7.95 (1/6/2016)	(7.63 - 7.95)/(5 - 4)	-0.32
7.6 (4/6/2016)	7.95 (1/6/2016)	(7.6 - 7.95)/(6 - 4)	-0.175
7.9 (5/27/2016)	7.95 (1/6/2016)	(7.9 - 7.95)/(7 - 4)	-0.0166667
8.5 (7/12/2016)	7.95 (1/6/2016)	(8.5 - 7.95)/(8 - 4)	0.1375
7.6 (4/6/2016)	7.63 (2/17/2016)	(7.6 - 7.63)/(6 - 5)	-0.03
7.9 (5/27/2016)	7.63 (2/17/2016)	(7.9 - 7.63)/(7 - 5)	0.135
8.5 (7/12/2016)	7.63 (2/17/2016)	(8.5 - 7.63)/(8 - 5)	0.29
7.9 (5/27/2016)	7.6 (4/6/2016)	(7.9 - 7.6)/(7 - 6)	0.3
8.5 (7/12/2016)	7.6 (4/6/2016)	(8.5 - 7.6)/(8 - 6)	0.45
8.5 (7/12/2016)	7.9 (5/27/2016)	(8.5 - 7.9)/(8 - 7)	0.6

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.32
2	-0.19

3	-0.175
4	-0.145
5	-0.1
6	-0.065
7	-0.058
8	-0.03
9	-0.025
10	-0.0233333
11	-0.0166667
12	0
13	0.00166667
14	0.015
15	0.02
16	0.04
17	0.075
18	0.0871429
19	0.125
20	0.133333
21	0.135
22	0.1375
23	0.18
24	0.29
25	0.3
26	0.35
27	0.45
28	0.6

Sen's Estimator (Median Q) is 0.0175

Tied Group	Value	Members
1	7.6	2

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112

Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -0.058 = Q(7)
Upper limit is 0.1375 = Q(22)
-0.058 < 0 < 0.1375 indicating no trend in data.

Sen's Slope Analysis

Parameter: pH(Field)

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.6 (10/15/2015)	7.41 (8/12/2015)	(7.6 - 7.41)/(2 - 1)	0.19
7.5 (11/19/2015)	7.41 (8/12/2015)	(7.5 - 7.41)/(3 - 1)	0.045
7.33 (1/5/2016)	7.41 (8/12/2015)	(7.33 - 7.41)/(4 - 1)	-0.0266667
7.22 (2/16/2016)	7.41 (8/12/2015)	(7.22 - 7.41)/(5 - 1)	-0.0475
7.1 (4/7/2016)	7.41 (8/12/2015)	(7.1 - 7.41)/(6 - 1)	-0.062
7.4 (5/27/2016)	7.41 (8/12/2015)	(7.4 - 7.41)/(7 - 1)	-0.00166667
7.3 (7/11/2016)	7.41 (8/12/2015)	(7.3 - 7.41)/(8 - 1)	-0.0157143
7.5 (11/19/2015)	7.6 (10/15/2015)	(7.5 - 7.6)/(3 - 2)	-0.1
7.33 (1/5/2016)	7.6 (10/15/2015)	(7.33 - 7.6)/(4 - 2)	-0.135
7.22 (2/16/2016)	7.6 (10/15/2015)	(7.22 - 7.6)/(5 - 2)	-0.126667
7.1 (4/7/2016)	7.6 (10/15/2015)	(7.1 - 7.6)/(6 - 2)	-0.125
7.4 (5/27/2016)	7.6 (10/15/2015)	(7.4 - 7.6)/(7 - 2)	-0.04
7.3 (7/11/2016)	7.6 (10/15/2015)	(7.3 - 7.6)/(8 - 2)	-0.05
7.33 (1/5/2016)	7.5 (11/19/2015)	(7.33 - 7.5)/(4 - 3)	-0.17
7.22 (2/16/2016)	7.5 (11/19/2015)	(7.22 - 7.5)/(5 - 3)	-0.14
7.1 (4/7/2016)	7.5 (11/19/2015)	(7.1 - 7.5)/(6 - 3)	-0.133333
7.4 (5/27/2016)	7.5 (11/19/2015)	(7.4 - 7.5)/(7 - 3)	-0.025
7.3 (7/11/2016)	7.5 (11/19/2015)	(7.3 - 7.5)/(8 - 3)	-0.04
7.22 (2/16/2016)	7.33 (1/5/2016)	(7.22 - 7.33)/(5 - 4)	-0.11
7.1 (4/7/2016)	7.33 (1/5/2016)	(7.1 - 7.33)/(6 - 4)	-0.115
7.4 (5/27/2016)	7.33 (1/5/2016)	(7.4 - 7.33)/(7 - 4)	0.0233333
7.3 (7/11/2016)	7.33 (1/5/2016)	(7.3 - 7.33)/(8 - 4)	-0.0075
7.1 (4/7/2016)	7.22 (2/16/2016)	(7.1 - 7.22)/(6 - 5)	-0.12
7.4 (5/27/2016)	7.22 (2/16/2016)	(7.4 - 7.22)/(7 - 5)	0.09
7.3 (7/11/2016)	7.22 (2/16/2016)	(7.3 - 7.22)/(8 - 5)	0.0266667
7.4 (5/27/2016)	7.1 (4/7/2016)	(7.4 - 7.1)/(7 - 6)	0.3
7.3 (7/11/2016)	7.1 (4/7/2016)	(7.3 - 7.1)/(8 - 6)	0.1
7.3 (7/11/2016)	7.4 (5/27/2016)	(7.3 - 7.4)/(8 - 7)	-0.1

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.17
2	-0.14

3	-0.135
4	-0.133333
5	-0.126667
6	-0.125
7	-0.12
8	-0.115
9	-0.11
10	-0.1
11	-0.1
12	-0.062
13	-0.05
14	-0.0475
15	-0.04
16	-0.04
17	-0.0266667
18	-0.025
19	-0.0157143
20	-0.0075
21	-0.00166667
22	0.0233333
23	0.0266667
24	0.045
25	0.09
26	0.1
27	0.19
28	0.3

Sen's Estimator (Median Q) is -0.04375

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

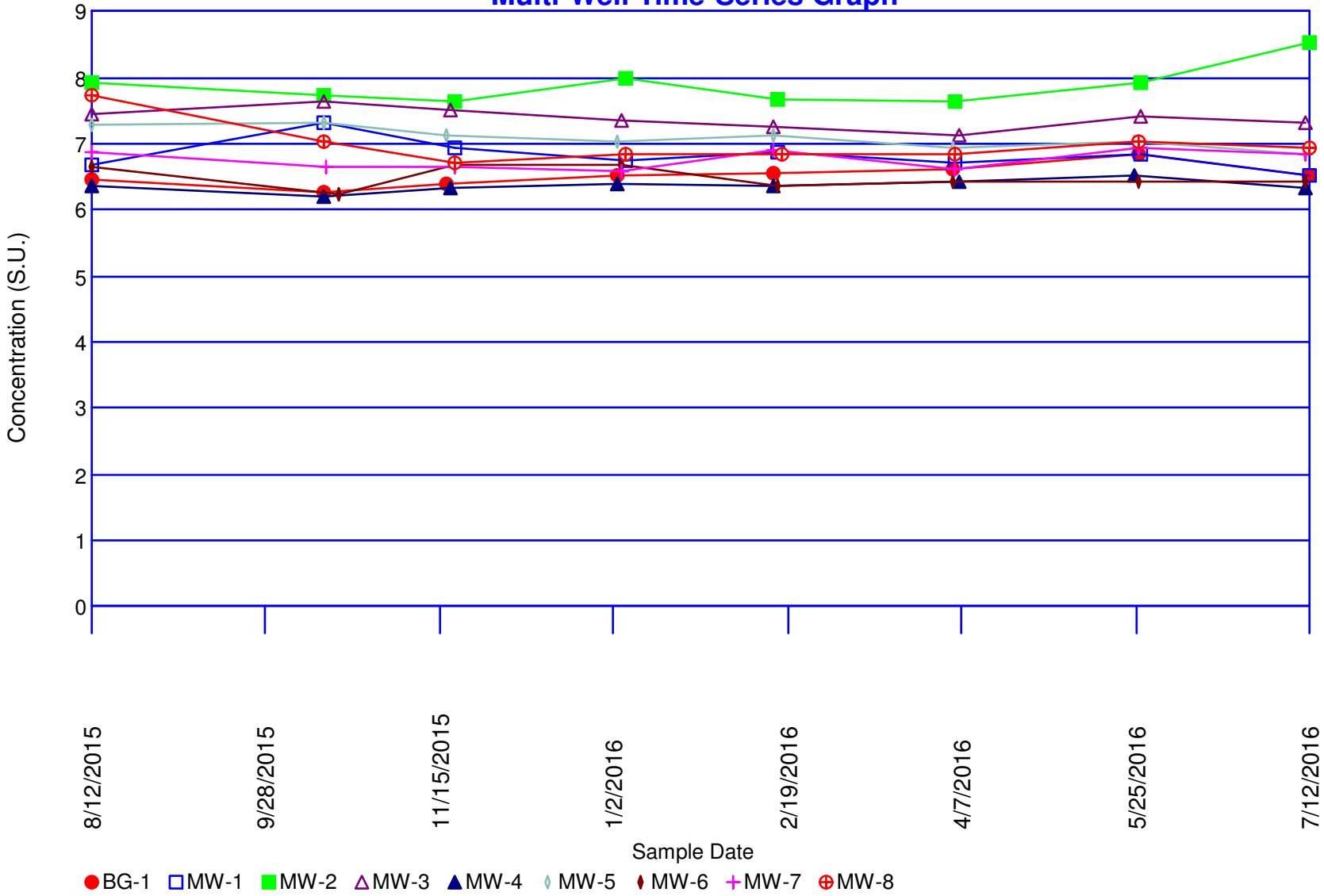
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.12 = Q(7)
Upper limit is 0.0233333 = Q(22)
-0.12 < 0 < 0.0233333 indicating no trend in data.

pH(Field)

Multi-Well Time-Series Graph



Concentrations (pCi/L)

Parameter: Radium 226

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 70
Total Non-Detect: 9
Percent Non-Detects: 12.8571%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	1 (12.5%)	8/12/2015	0.802	0.802
			10/15/2015	0.362	0.362
			11/20/2015	0.8	0.8
			1/5/2016	ND<0.206 U	ND<0.206 U
			2/16/2016	0.553	0.553
			4/6/2016	0.423	0.423
			5/25/2016	0.654	0.654
			7/11/2016	0.777	0.777

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	0.709	0.709
			10/15/2015	0.387	0.387
			11/20/2015	0.414	0.414
			1/5/2016	0.209	0.209
			2/16/2016	0.276	0.276
			4/6/2016	0.141	0.141
			5/25/2016	0.254	0.254
			7/11/2016	0.448	0.448
MW-2	8	0 (0%)	8/12/2015	1.33	1.33
			10/15/2015	0.681	0.681
			11/20/2015	0.985	0.985
			1/5/2016	0.716	0.716
			2/16/2016	1.22	1.22
			4/6/2016	1.94	1.94
			5/25/2016	0.69	0.69
			7/11/2016	0.58	0.58
MW-3	8	0 (0%)	8/12/2015	0.99	0.99
			10/15/2015	1.59	1.59
			11/20/2015	0.816	0.816
			1/5/2016	0.213	0.213
			2/16/2016	1.18	1.18
			4/6/2016	0.605	0.605
			5/25/2016	1.24	1.24
			7/11/2016	0.308	0.308

MW-4	8	1 (12.5%)	8/12/2015	0.814	0.814
			10/15/2015	0.281	0.281
			11/20/2015	0.406	0.406
			1/5/2016	ND<0.12 U	ND<0.12 U
			2/16/2016	0.0693	0.0693
			4/6/2016	0.444	0.444
			5/25/2016	0.295	0.295
			7/11/2016	0.185	0.185
MW-5	7	3 (42.8571%)	8/12/2015	0.564	0.564
			10/15/2015	0.708	0.708
			11/20/2015	0.592	0.592
			1/5/2016	ND<0.066 U	ND<0.066 U
			4/6/2016	ND<0 U	ND<0 U
			5/25/2016	0.077	0.077
			7/11/2016	ND<0.092 U	ND<0.092 U
MW-6	8	2 (25%)	8/12/2015	0.806	0.806
			10/15/2015	0.172	0.172
			11/20/2015	0.0638	0.0638
			1/5/2016	0.91	0.91
			2/16/2016	0.0812	0.0812
			4/6/2016	ND<0.068 U	ND<0.068 U
			5/25/2016	ND<0.075 U	ND<0.075 U
			7/11/2016	0.393	0.393
MW-7	7	1 (14.2857%)	8/12/2015	0.423	0.423
			10/15/2015	0.464	0.464
			11/20/2015	0.856	0.856
			1/5/2016	0.349	0.349
			4/6/2016	0.279	0.279
			5/25/2016	0.064	0.064
			7/11/2016	ND<0 U	ND<0 U
MW-8	8	1 (12.5%)	8/12/2015	0.92	0.92
			10/15/2015	0.0774	0.0774
			11/20/2015	1.16	1.16
			1/5/2016	ND<0 U	ND<0 U
			2/16/2016	0.116	0.116
			4/6/2016	0.73	0.73
			5/25/2016	0.719	0.719
			7/11/2016	0.616	0.616

There are 2 unused locations

Loc.	Meas.	ND	Date	Conc.	Original
SW-1	7	0 (0%)	8/12/2015	0.521	0.521
			10/15/2015	0.141	0.141
			11/20/2015	0.147	0.147

			1/5/2016	0.39	0.39
			2/16/2016	0.454	0.454
			4/6/2016	0.499	0.499
			5/25/2016	0.536	0.536
SW-2	7	4 (57.1429%)	8/12/2015	0.363	0.363
			10/15/2015	ND<0.344 U	ND<0.344 U
			11/20/2015	0.172	0.172
			1/5/2016	ND<0.213 U	ND<0.213 U
			2/16/2016	ND<0.17 U	ND<0.17 U
			4/6/2016	ND<0.133 U	ND<0.133 U
			5/25/2016	0.141	0.141

Rosner's Test for Outliers

Parameter: Radium-226

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 0.516628

10 most extreme of 71 measurements

by order of magnitude difference from the mean

1	4/6/2016	MW-2	1.94	1.42337
2	10/15/2015	MW-3	1.59	1.07337
3	8/12/2015	MW-2	1.33	0.813372
4	5/27/2016	MW-3	1.24	0.723372
5	2/17/2016	MW-2	1.22	0.703372
6	2/16/2016	MW-3	1.18	0.663372
7	11/20/2015	MW-8	1.16	0.643372
8	7/11/2016	MW-7	ND<0	-0.516628
9	4/5/2016	MW-5	ND<0	-0.516628
10	1/6/2016	MW-8	ND<0	-0.516628

Iteration i = 9

Mean of 62 measurements = 0.435816
Std Dev = 0.288722
x(i+1) = 0 from measurement 1/6/2016 from location MW-8
Rosner Statistic R = |0 - 0.435816|/0.288722 = 1.50947
Lambda(71, 10, 0.05) = 3.215
1.50947 < 3.215 -- No outliers detected for i = 9

Iteration i = 8

Mean of 63 measurements = 0.428898
Std Dev = 0.2916
x(i+1) = 0 from measurement 4/5/2016 from location MW-5
Rosner Statistic R = |0 - 0.428898|/0.2916 = 1.47085
Lambda(71, 9, 0.05) = 3.221
1.47085 < 3.221 -- No outliers detected for i = 8

Iteration i = 7

Mean of 64 measurements = 0.422197
Std Dev = 0.294203
x(i+1) = 0 from measurement 7/11/2016 from location MW-7
Rosner Statistic R = |0 - 0.422197|/0.294203 = 1.43506
Lambda(71, 8, 0.05) = 3.227
1.43506 < 3.227 -- No outliers detected for i = 7

Iteration i = 6

Mean of 65 measurements = 0.433548

Std Dev = 0.305904
x(i+1) = 1.16 from measurement 11/20/2015 from location MW-8
Rosner Statistic R = |1.16 - 0.433548|/0.305904 = 2.37477
Lambda(71, 7, 0.05) = 3.233
2.37477 < 3.233 -- No outliers detected for i = 6

Iteration i = 5
Mean of 66 measurements = 0.444858
Std Dev = 0.317144
x(i+1) = 1.18 from measurement 2/16/2016 from location MW-3
Rosner Statistic R = |1.18 - 0.444858|/0.317144 = 2.31801
Lambda(71, 6, 0.05) = 3.239
2.31801 < 3.239 -- No outliers detected for i = 5

Iteration i = 4
Mean of 67 measurements = 0.456427
Std Dev = 0.32867
x(i+1) = 1.22 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |1.22 - 0.456427|/0.32867 = 2.32322
Lambda(71, 5, 0.05) = 3.245
2.32322 < 3.245 -- No outliers detected for i = 4

Iteration i = 3
Mean of 68 measurements = 0.46795
Std Dev = 0.339766
x(i+1) = 1.24 from measurement 5/27/2016 from location MW-3
Rosner Statistic R = |1.24 - 0.46795|/0.339766 = 2.2723
Lambda(71, 4, 0.05) = 3.245
2.2723 < 3.245 -- No outliers detected for i = 3

Iteration i = 2
Mean of 69 measurements = 0.480443
Std Dev = 0.352864
x(i+1) = 1.33 from measurement 8/12/2015 from location MW-2
Rosner Statistic R = |1.33 - 0.480443|/0.352864 = 2.4076
Lambda(71, 3, 0.05) = 3.255
2.4076 < 3.255 -- No outliers detected for i = 2

Iteration i = 1
Mean of 70 measurements = 0.496294
Std Dev = 0.374561
x(i+1) = 1.59 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |1.59 - 0.496294|/0.374561 = 2.91997
Lambda(71, 2, 0.05) = 3.255
2.91997 < 3.255 -- No outliers detected for i = 1

Iteration i = 0

Mean of 71 measurements = 0.516628

Std Dev = 0.409448

x(i+1) = 1.94 from measurement 4/6/2016 from location MW-2

Rosner Statistic R = |1.94 - 0.516628|/0.409448 = 3.47632

Lambda(71, 1, 0.05) = 3.265

3.47632 > 3.265 -- Measurement 4/6/2016 for location MW-2 is an outlier

Parametric Prediction Interval Analysis

Inter-Well Comparison
Parameter: Radium-226

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 0.55725
Background Std Dev = 0.25172

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.448	[0, 1.4581]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.58	[0, 1.4581]	FALSE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.308	[0, 1.4581]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.185	[0, 1.4581]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.046	[0, 1.4581]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0.393	[0, 1.4581]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	0	[0, 1.4581]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	0.616	[0, 1.4581]	FALSE

Confidence Interval

Parameter: Radium-226

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

Background Locations

Location	**BG-1**
Mean	0.55725
Std Dev	0.25172
Degrees of Freedom	7
Comparison Level	**0.8**
Untransformed Comp. Level	0.8

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.290443, 0.824057]	0.55725	FALSE
95%	1.89458	[0.38864, 0.72586]	0.55725	FALSE

Compliance Locations

Location	**MW-1**
Mean	0.35475
Std Dev	0.178094
Degrees of Freedom	7
Comparison Level	**0.2**
Untransformed Comp. Level	0.2

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.165981, 0.543519]	0.35475	FALSE
95%	1.89458	[0.235456, 0.474044]	0.35475	**TRUE**

Location	**MW-2**
Mean	1.01775
Std Dev	0.461909
Degrees of Freedom	7
Comparison Level	**0.77**
Untransformed Comp. Level	0.77

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.528156, 1.50734]	1.01775	FALSE
95%	1.89458	[0.708347, 1.32715]	1.01775	FALSE

Location	**MW-3**
Mean	0.86775
Std Dev	0.476054

Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.363163, 1.37234]	0.86775	FALSE
95%	1.89458	[0.548873, 1.18663]	0.86775	FALSE

Location	**MW-4**
Mean	0.319288
Std Dev	0.244256
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.0603925, 0.578183]	0.319288	**TRUE**
95%	1.89458	[0.155677, 0.482898]	0.319288	**TRUE**

Location	**MW-5**
Mean	0.261325
Std Dev	0.301807
Degrees of Freedom	7
Comparison Level	**0.85**
Untransformed Comp. Level	0.85

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[-0.0585706, 0.581221]	0.261325	FALSE
95%	1.89458	[0.0591644, 0.463486]	0.261325	FALSE

Location	**MW-6**
Mean	0.312187
Std Dev	0.357632
Degrees of Freedom	7
Comparison Level	**0.98**
Untransformed Comp. Level	0.98

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[-0.0668797, 0.691255]	0.312187	FALSE
95%	1.89458	[0.072633, 0.551742]	0.312187	FALSE

Location	**MW-7**
Mean	0.3479
Std Dev	0.283871
Degrees of Freedom	6
Comparison Level	**0.89**
Untransformed Comp. Level	0.89

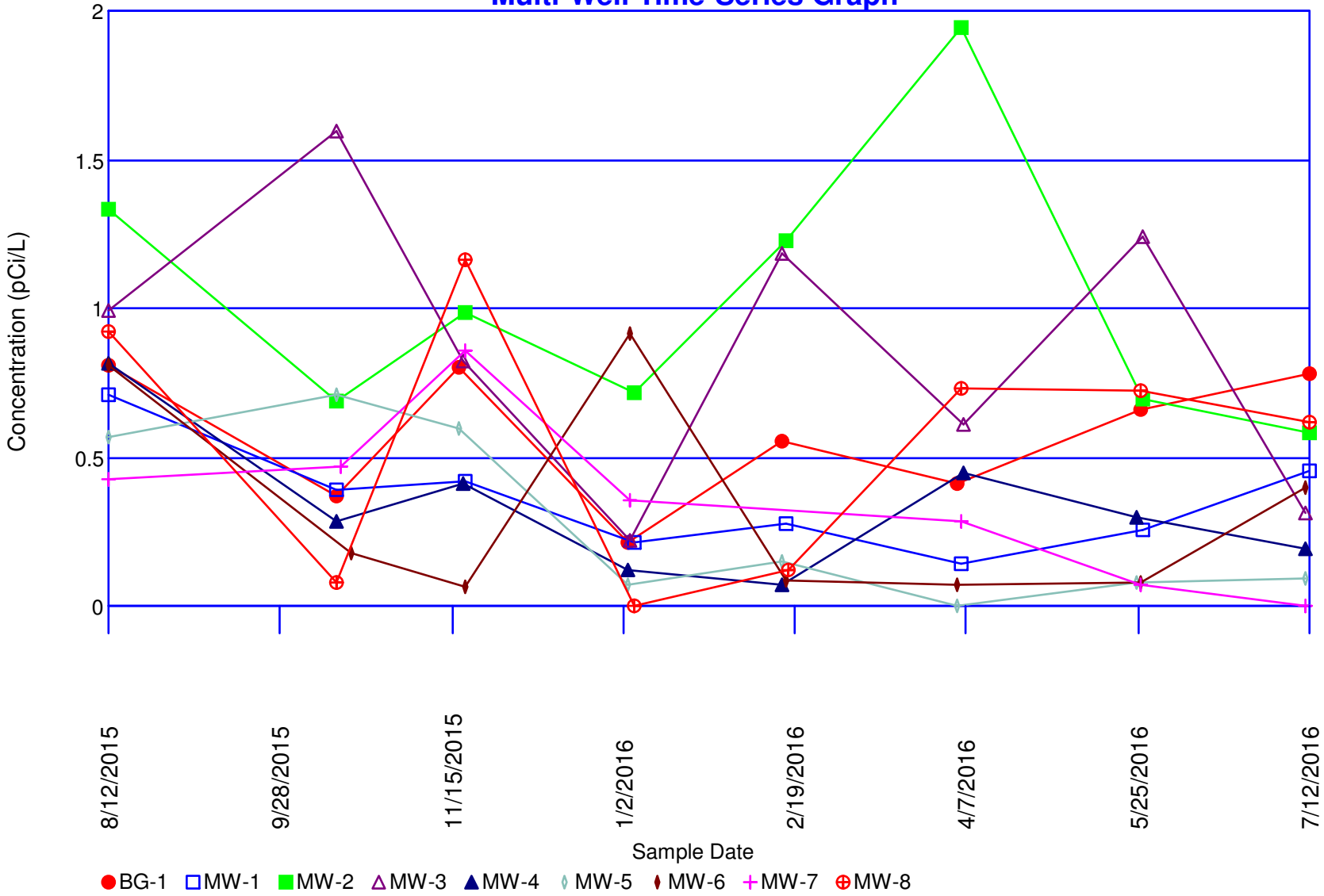
Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[0.0107132, 0.685087]	0.3479	FALSE
95%	1.94318	[0.13941, 0.55639]	0.3479	FALSE

Location	**MW-8**
Mean	0.5423
Std Dev	0.42896
Degrees of Freedom	7
Comparison Level	**0.83**
Untransformed Comp. Level	0.83

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.0876298, 0.99697]	0.5423	FALSE
95%	1.89458	[0.254968, 0.829632]	0.5423	FALSE

Radium-226

Multi-Well Time-Series Graph



Concentrations (pCi/L)

Parameter: Radium 228

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 70
Total Non-Detect: 9
Percent Non-Detects: 12.8571%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	1 (12.5%)	8/12/2015	ND<0.496 U	ND<0.496 U
			10/15/2015	0.723	0.723
			11/20/2015	1.29	1.29
			1/5/2016	0.808	0.808
			2/16/2016	0.256	0.256
			4/6/2016	0.828	0.828
			5/25/2016	0.011	0.011
			7/11/2016	0.163	0.163

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	2 (25%)	8/12/2015	ND<0.538 U	ND<0.538 U
			10/15/2015	0.0801	0.0801
			11/20/2015	0.511	0.511
			1/5/2016	0.455	0.455
			2/16/2016	0.47	0.47
			4/6/2016	0.402	0.402
			5/25/2016	ND<0.047 U	ND<0.047 U
			7/11/2016	0.883	0.883
MW-2	8	1 (12.5%)	8/12/2015	ND<1.39 U	ND<1.39 U
			10/15/2015	1.56	1.56
			11/20/2015	1.75	1.75
			1/5/2016	1.69	1.69
			2/16/2016	1.15	1.15
			4/6/2016	1.08	1.08
			5/25/2016	0.433	0.433
			7/11/2016	0.98	0.98
MW-3	8	0 (0%)	8/12/2015	2.03	2.03
			10/15/2015	1.34	1.34
			11/20/2015	1.95	1.95
			1/5/2016	0.209	0.209
			2/16/2016	1.78	1.78
			4/6/2016	1.22	1.22
			5/25/2016	1.75	1.75
			7/11/2016	0.801	0.801

MW-4	8	1 (12.5%)	8/12/2015	ND<1.52 U	ND<1.52 U
			10/15/2015	0.023	0.023
			11/20/2015	0.174	0.174
			1/5/2016	0.481	0.481
			2/16/2016	0.171	0.171
			4/6/2016	0.019	0.019
			5/25/2016	0.584	0.584
			7/11/2016	0.455	0.455
MW-5	7	1 (14.2857%)	8/12/2015	ND<0.52 U	ND<0.52 U
			10/15/2015	0.331	0.331
			11/20/2015	0.359	0.359
			1/5/2016	0.425	0.425
			4/6/2016	0.951	0.951
			5/25/2016	0.012	0.012
			7/11/2016	0.568	0.568
MW-6	8	1 (12.5%)	8/12/2015	ND<1.26 U	ND<1.26 U
			10/15/2015	0.395	0.395
			11/20/2015	0.791	0.791
			1/5/2016	0.555	0.555
			2/16/2016	0.249	0.249
			4/6/2016	0.912	0.912
			5/25/2016	0.148	0.148
			7/11/2016	0.907	0.907
MW-7	7	1 (14.2857%)	8/12/2015	ND<0.271 U	ND<0.271 U
			10/15/2015	0.273	0.273
			11/20/2015	1.15	1.15
			1/5/2016	0.243	0.243
			4/6/2016	0.188	0.188
			5/25/2016	0.126	0.126
			7/11/2016	0.019	0.019
MW-8	8	1 (12.5%)	8/12/2015	ND<0.931 U	ND<0.931 U
			10/15/2015	0.809	0.809
			11/20/2015	0.702	0.702
			1/5/2016	0.864	0.864
			2/16/2016	1.11	1.11
			4/6/2016	0.937	0.937
			5/25/2016	0.521	0.521
			7/11/2016	0.548	0.548

There are 2 unused locations

Loc.	Meas.	ND	Date	Conc.	Original
SW-1	7	1 (14.2857%)	8/12/2015	ND<0.426 U	ND<0.426 U
			10/15/2015	644	644
			11/20/2015	1.94	1.94

			1/5/2016	0.472	0.472
			2/16/2016	1.24	1.24
			4/6/2016	0.761	0.761
			5/25/2016	0.544	0.544
SW-2	7	2 (28.5714%)	8/12/2015	ND<0.468 U	ND<0.468 U
			10/15/2015	0.245	0.245
			11/20/2015	0.391	0.391
			1/5/2016	0.833	0.833
			2/16/2016	ND<0.147 U	ND<0.147 U
			4/6/2016	0.397	0.397
			5/25/2016	0.703	0.703

Rosner's Test for Outliers

Parameter: Radium-228

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 0.699714

10 most extreme of 71 measurements

by order of magnitude difference from the mean

1	8/12/2015	MW-3	2.03	1.33029
2	11/19/2015	MW-3	1.95	1.25029
3	2/16/2016	MW-3	1.78	1.08029
4	11/19/2015	MW-2	1.75	1.05029
5	5/27/2016	MW-3	1.75	1.05029
6	1/6/2016	MW-2	1.69	0.990286
7	10/15/2015	MW-2	1.56	0.860286
8	8/12/2015	MW-4	ND<1.52 U	0.820286
9	8/12/2015	MW-2	ND<1.39 U	0.690286
10	5/26/2016	BG-1	0.0108	-0.688914

Iteration i = 9

Mean of 62 measurements = 0.552576
Std Dev = 0.375486
x(i+1) = 0.0108 from measurement 5/26/2016 from location BG-1
Rosner Statistic R = |0.0108 - 0.552576|/0.375486 = 1.44287
Lambda(71, 10, 0.05) = 3.215
1.44287 < 3.215 -- No outliers detected for i = 9

Iteration i = 8

Mean of 63 measurements = 0.565868
Std Dev = 0.387101
x(i+1) = 1.39 from measurement 8/12/2015 from location MW-2
Rosner Statistic R = |1.39 - 0.565868|/0.387101 = 2.12898
Lambda(71, 9, 0.05) = 3.221
2.12898 < 3.221 -- No outliers detected for i = 8

Iteration i = 7

Mean of 64 measurements = 0.580777
Std Dev = 0.402111
x(i+1) = 1.52 from measurement 8/12/2015 from location MW-4
Rosner Statistic R = |1.52 - 0.580777|/0.402111 = 2.33573
Lambda(71, 8, 0.05) = 3.227
2.33573 < 3.227 -- No outliers detected for i = 7

Iteration i = 6

Mean of 65 measurements = 0.595842

Std Dev = 0.417035
x(i+1) = 1.56 from measurement 10/15/2015 from location MW-2
Rosner Statistic R = |1.56 - 0.595842|/0.417035 = 2.31193
Lambda(71, 7, 0.05) = 3.233
2.31193 < 3.233 -- No outliers detected for i = 6

Iteration i = 5

Mean of 66 measurements = 0.61242
Std Dev = 0.43518
x(i+1) = 1.69 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |1.69 - 0.61242|/0.43518 = 2.47617
Lambda(71, 6, 0.05) = 3.239
2.47617 < 3.239 -- No outliers detected for i = 5

Iteration i = 4

Mean of 67 measurements = 0.629399
Std Dev = 0.453682
x(i+1) = 1.75 from measurement 5/27/2016 from location MW-3
Rosner Statistic R = |1.75 - 0.629399|/0.453682 = 2.47002
Lambda(71, 5, 0.05) = 3.245
2.47002 < 3.245 -- No outliers detected for i = 4

Iteration i = 3

Mean of 68 measurements = 0.645878
Std Dev = 0.470343
x(i+1) = 1.75 from measurement 11/19/2015 from location MW-2
Rosner Statistic R = |1.75 - 0.645878|/0.470343 = 2.34748
Lambda(71, 4, 0.05) = 3.245
2.34748 < 3.245 -- No outliers detected for i = 3

Iteration i = 2

Mean of 69 measurements = 0.662314
Std Dev = 0.486426
x(i+1) = 1.78 from measurement 2/16/2016 from location MW-3
Rosner Statistic R = |1.78 - 0.662314|/0.486426 = 2.29775
Lambda(71, 3, 0.05) = 3.255
2.29775 < 3.255 -- No outliers detected for i = 2

Iteration i = 1

Mean of 70 measurements = 0.68071
Std Dev = 0.506822
x(i+1) = 1.95 from measurement 11/19/2015 from location MW-3
Rosner Statistic R = |1.95 - 0.68071|/0.506822 = 2.50441
Lambda(71, 2, 0.05) = 3.255
2.50441 < 3.255 -- No outliers detected for i = 1

Iteration i = 0

Mean of 71 measurements = 0.699714
Std Dev = 0.528054
x(i+1) = 2.03 from measurement 8/12/2015 from location MW-3
Rosner Statistic R = |2.03 - 0.699714|/0.528054 = 2.51922
Lambda(71, 1, 0.05) = 3.265
2.51922 < 3.265 -- No outliers detected for i = 0

Confidence Interval

Parameter: Radium-228

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	0.57185
Std Dev	0.42214
Degrees of Freedom	7
Comparison Level	**0.62**
Untransformed Comp. Level	0.62

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.124409, 1.01929]	0.57185	FALSE
95%	1.89458	[0.289086, 0.854614]	0.57185	FALSE

Compliance Locations

Location	**MW-1**
Mean	0.416975
Std Dev	0.254006
Degrees of Freedom	7
Comparison Level	**0.64**
Untransformed Comp. Level	0.64

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.147745, 0.686205]	0.416975	FALSE
95%	1.89458	[0.246833, 0.587117]	0.416975	FALSE

Location	**MW-2**
Mean	1.25413
Std Dev	0.437273
Degrees of Freedom	7
Comparison Level	**0.65**
Untransformed Comp. Level	0.65

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.790644, 1.71761]	1.25413	**TRUE**
95%	1.89458	[0.961225, 1.54703]	1.25413	**TRUE**

Location	**MW-3**
Mean	1.385
Std Dev	0.629941
Degrees of Freedom	7
Comparison Level	**0.66**
Untransformed Comp. Level	0.66

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[0.717303, 2.0527]	1.385	**TRUE**
95%	1.89458	[0.963044, 1.80696]	1.385	**TRUE**

Location	**MW-4**
Mean	0.428375
Std Dev	0.49022
Degrees of Freedom	7
Comparison Level	**0**
Untransformed Comp. Level	0

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[-0.0912261, 0.947976]	0.428375	FALSE
95%	1.89458	[0.100009, 0.756741]	0.428375	**TRUE**

Location	**MW-5**
Mean	0.415012
Std Dev	0.283466
Degrees of Freedom	7
Comparison Level	**0.69**
Untransformed Comp. Level	0.69

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.114557, 0.715468]	0.415012	FALSE
95%	1.89458	[0.225137, 0.604888]	0.415012	FALSE

Location	**MW-6**
Mean	0.652125
Std Dev	0.380506
Degrees of Freedom	7
Comparison Level	**0.75**
Untransformed Comp. Level	0.75

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.248814, 1.05544]	0.652125	FALSE
95%	1.89458	[0.397249, 0.907001]	0.652125	FALSE

Location	**MW-7**
Mean	0.324286
Std Dev	0.375271
Degrees of Freedom	6
Comparison Level	**0.59**
Untransformed Comp. Level	0.59

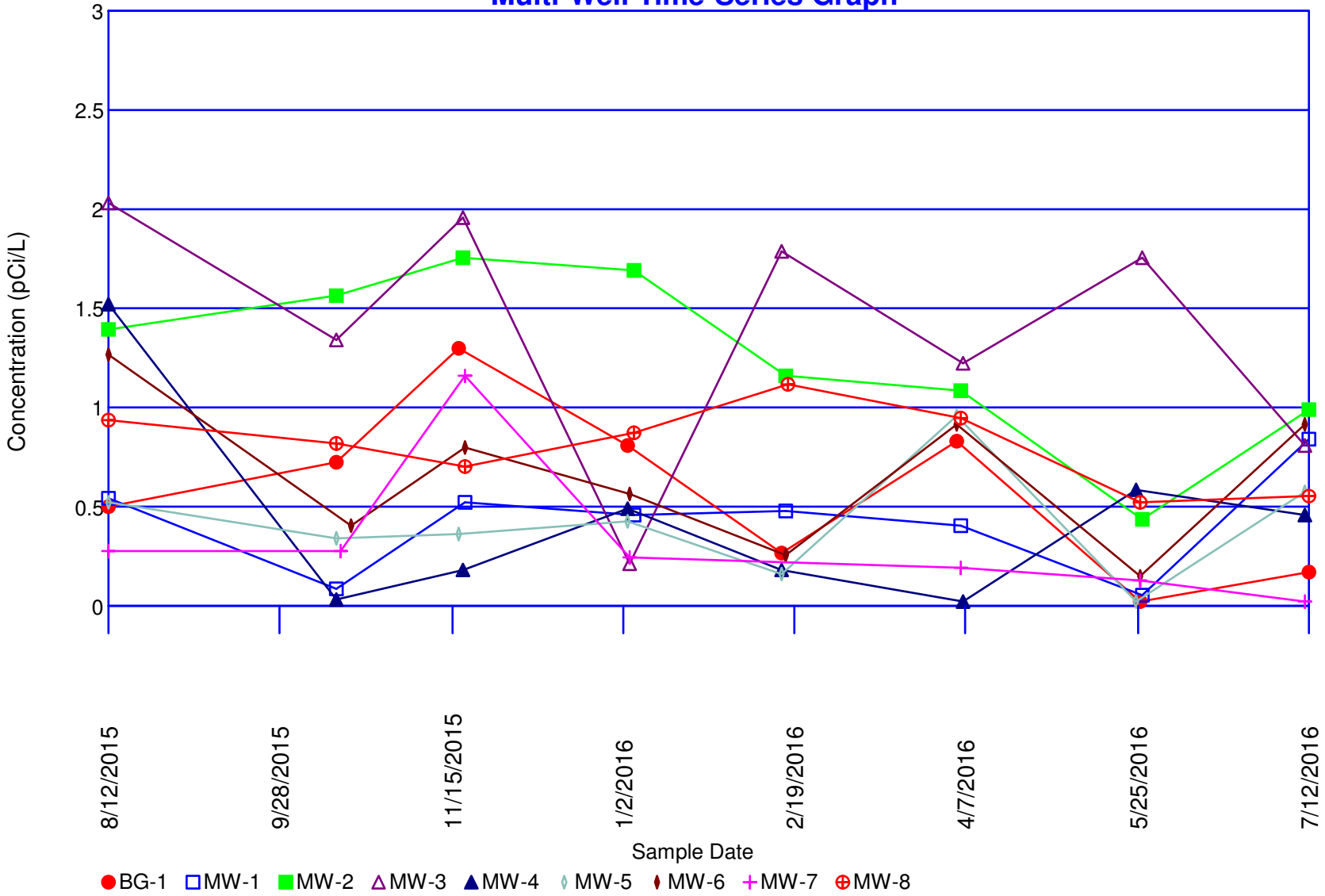
Confidence	t-Stat	Interval	Mid-Point	Significant
99%	3.14267	[-0.121468, 0.770039]	0.324286	FALSE
95%	1.94318	[0.0486664, 0.599905]	0.324286	FALSE

Location	**MW-8**
Mean	0.80275
Std Dev	0.202518
Degrees of Freedom	7
Comparison Level	**0.64**
Untransformed Comp. Level	0.64

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[0.588094, 1.01741]	0.80275	FALSE
95%	1.89458	[0.667096, 0.938404]	0.80275	**TRUE**

Radium-228

Multi-Well Time-Series Graph



Concentrations (mg/L)

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	23	23
			10/15/2015	15.1	15.1
			11/18/2015	17.5	17.5
			1/4/2016	19.5	19.5
			2/16/2016	18.6	18.6
			4/5/2016	19.6	19.6
			5/26/2016	19.3	19.3
			7/12/2016	18.2	18.2

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	23 J	23 J
			10/15/2015	13.1	13.1
			11/20/2015	9.8	9.8
			1/6/2016	11.2	11.2
			2/17/2016	8.7	8.7
			4/6/2016	10.5	10.5
			5/27/2016	10.9	10.9
			7/12/2016	9.4	9.4
MW-2	8	0 (0%)	8/12/2015	79	79
			10/15/2015	199	199
			11/19/2015	238	238
			1/6/2016	228	228
			2/17/2016	247	247
			4/6/2016	230	230
			5/27/2016	163	163
			7/12/2016	205	205
MW-3	8	0 (0%)	8/12/2015	24 J	24 J
			10/15/2015	14	14
			11/19/2015	12.3	12.3
			1/5/2016	10	10
			2/16/2016	9.1	9.1
			4/7/2016	12.9	12.9
			5/27/2016	16.8	16.8
			7/11/2016	125	125

MW-4	8	0 (0%)	8/12/2015	11	11
			10/15/2015	7	7
			11/19/2015	5.9	5.9
			1/4/2016	6.3	6.3
			2/16/2016	5.6	5.6
			4/7/2016	3.9	3.9
			5/25/2016	3.4	3.4
			7/13/2016	9.2	9.2
MW-5	8	0 (0%)	8/12/2015	4.1	4.1
			10/15/2015	3.7	3.7
			11/18/2015	3.1	3.1
			1/4/2016	4.1	4.1
			2/16/2016	3.6	3.6
			4/5/2016	3.1	3.1
			5/25/2016	3.4	3.4
			7/11/2016	2.6	2.6
MW-6	8	0 (0%)	8/12/2015	48	48
			10/19/2015	66.1	66.1
			11/20/2015	137	137
			1/5/2016	194	194
			2/17/2016	87.7	87.7
			4/5/2016	214	214
			5/26/2016	51.6	51.6
			7/11/2016	53.8	53.8
MW-7	8	0 (0%)	8/12/2015	36	36
			10/16/2015	46.9	46.9
			11/20/2015	44.3	44.3
			1/5/2016	32.1	32.1
			2/18/2016	40.4	40.4
			4/6/2016	38	38
			5/26/2016	19.1	19.1
			7/11/2016	11.2	11.2
MW-8	8	0 (0%)	8/12/2015	6.3	6.3
			10/15/2015	6.1	6.1
			11/20/2015	4.4	4.4
			1/6/2016	5.5	5.5
			2/18/2016	5.6	5.6
			4/6/2016	5.7	5.7
			5/26/2016	6	6
			7/12/2016	5.9	5.9

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Sulfate

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 45.9194

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	2/17/2016	MW-2	247	201.081
2	11/19/2015	MW-2	238	192.081
3	4/6/2016	MW-2	230	184.081
4	1/6/2016	MW-2	228	182.081
5	4/5/2016	MW-6	214	168.081
6	7/12/2016	MW-2	205	159.081
7	10/15/2015	MW-2	199	153.081
8	1/5/2016	MW-6	194	148.081
9	5/27/2016	MW-2	163	117.081
10	11/20/2015	MW-6	137	91.0806

Iteration i = 9

Mean of 63 measurements = 22.0349
Std Dev = 27.3909
x(i+1) = 137 from measurement 11/20/2015 from location MW-6
Rosner Statistic R = |137 - 22.0349|/27.3909 = 4.1972
Lambda(72, 10, 0.05) = 3.22
4.1972 > 3.22 -- Measurement 11/20/2015 for location MW-6 is an outlier

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Iteration i = 8

Mean of 64 measurements = 24.2375
Std Dev = 32.3858
x(i+1) = 163 from measurement 5/27/2016 from location MW-2
Rosner Statistic R = |163 - 24.2375|/32.3858 = 4.28468
Lambda(72, 9, 0.05) = 3.226
Measurement 5/27/2016 for location MW-2 is an outlier

Iteration i = 7

Mean of 65 measurements = 26.8492
Std Dev = 38.4164
x(i+1) = 194 from measurement 1/5/2016 from location MW-6
Rosner Statistic R = |194 - 26.8492|/38.4164 = 4.35102
Lambda(72, 8, 0.05) = 3.232
Measurement 1/5/2016 for location MW-6 is an outlier

Iteration i = 6

Mean of 66 measurements = 29.4576

Std Dev = 43.6136
x(i+1) = 199 from measurement 10/15/2015 from location MW-2
Rosner Statistic R = |199 - 29.4576|/43.6136 = 3.88737
Lambda(72, 7, 0.05) = 3.238
Measurement 10/15/2015 for location MW-2 is an outlier

Iteration i = 5

Mean of 67 measurements = 32.0776
Std Dev = 48.3038
x(i+1) = 205 from measurement 7/12/2016 from location MW-2
Rosner Statistic R = |205 - 32.0776|/48.3038 = 3.57989
Lambda(72, 6, 0.05) = 3.244
Measurement 7/12/2016 for location MW-2 is an outlier

Iteration i = 4

Mean of 68 measurements = 34.7529
Std Dev = 52.7743
x(i+1) = 214 from measurement 4/5/2016 from location MW-6
Rosner Statistic R = |214 - 34.7529|/52.7743 = 3.39648
Lambda(72, 5, 0.05) = 3.25
Measurement 4/5/2016 for location MW-6 is an outlier

Iteration i = 3

Mean of 69 measurements = 37.5536
Std Dev = 57.3184
x(i+1) = 228 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |228 - 37.5536|/57.3184 = 3.32261
Lambda(72, 4, 0.05) = 3.25
Measurement 1/6/2016 for location MW-2 is an outlier

Iteration i = 2

Mean of 70 measurements = 40.3029
Std Dev = 61.3748
x(i+1) = 230 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |230 - 40.3029|/61.3748 = 3.0908
Lambda(72, 3, 0.05) = 3.26
Measurement 4/6/2016 for location MW-2 is an outlier

Iteration i = 1

Mean of 71 measurements = 43.0873
Std Dev = 65.2957
x(i+1) = 238 from measurement 11/19/2015 from location MW-2
Rosner Statistic R = |238 - 43.0873|/65.2957 = 2.98508
Lambda(72, 2, 0.05) = 3.26
Measurement 11/19/2015 for location MW-2 is an outlier

Iteration i = 0

Mean of 72 measurements = 45.9194

Std Dev = 69.1447

x(i+1) = 247 from measurement 2/17/2016 from location MW-2

Rosner Statistic R = |247 - 45.9194|/69.1447 = 2.90811

Lambda(72, 1, 0.05) = 3.27

Measurement 2/17/2016 for location MW-2 is an outlier

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 18.85
Background Std Dev = 2.22903

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	9.4	[0, 26.8272]	FALSE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	205	[0, 26.8272]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	125	[0, 26.8272]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	9.2	[0, 26.8272]	FALSE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	2.6	[0, 26.8272]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	53.8	[0, 26.8272]	TRUE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	11.2	[0, 26.8272]	FALSE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	5.9	[0, 26.8272]	FALSE

Confidence Interval

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	18.85
Std Dev	2.22903
Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[16.4874, 21.2126]	18.85	TRUE
95%	1.89458	[17.3569, 20.3431]	18.85	TRUE

Compliance Locations

Location	**MW-1**
Mean	12.075
Std Dev	4.60985
Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[7.18886, 16.9611]	12.075	TRUE
95%	1.89458	[8.98716, 15.1628]	12.075	TRUE

Location	**MW-2**
Mean	198.625
Std Dev	55.237
Degrees of Freedom	7
Comparison Level	**16**
Untransformed Comp. Level	16

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[140.077, 257.173]	198.625	TRUE
95%	1.89458	[161.625, 235.625]	198.625	TRUE

Location	**MW-3**
Mean	28.0125
Std Dev	39.4645
Degrees of Freedom	7
Comparison Level	**20**
Untransformed Comp. Level	20

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[-13.8173, 69.8423]	28.0125	FALSE
95%	1.89458	[1.5778, 54.4472]	28.0125	FALSE

Location	**MW-4**
Mean	6.5375
Std Dev	2.54555
Degrees of Freedom	7
Comparison Level	**16**
Untransformed Comp. Level	16

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[3.83938, 9.23562]	6.5375	FALSE
95%	1.89458	[4.8324, 8.2426]	6.5375	FALSE

Location	**MW-5**
Mean	3.4625
Std Dev	0.520817
Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[2.91047, 4.01453]	3.4625	**TRUE**
95%	1.89458	[3.11364, 3.81136]	3.4625	**TRUE**

Location	**MW-6**
Mean	106.525
Std Dev	66.9135
Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[35.6011, 177.449]	106.525	**TRUE**
95%	1.89458	[61.7041, 151.346]	106.525	**TRUE**

Location	**MW-7**
Mean	33.5
Std Dev	12.4035
Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[20.3531, 46.6469]	33.5	**TRUE**
95%	1.89458	[25.1917, 41.8083]	33.5	**TRUE**

Location	**MW-8**
Mean	5.6875
Std Dev	0.584166
Degrees of Freedom	7
Comparison Level	**1**
Untransformed Comp. Level	1

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[5.06832, 6.30668]	5.6875	**TRUE**
95%	1.89458	[5.29621, 6.07879]	5.6875	**TRUE**

Sen's Slope Analysis

Parameter: Sulfate
Location: MW-2

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
199 (10/15/2015)	79 (8/12/2015)	(199 - 79)/(2 - 1)	120
238 (11/19/2015)	79 (8/12/2015)	(238 - 79)/(3 - 1)	79.5
228 (1/6/2016)	79 (8/12/2015)	(228 - 79)/(4 - 1)	49.6667
247 (2/17/2016)	79 (8/12/2015)	(247 - 79)/(5 - 1)	42
230 (4/6/2016)	79 (8/12/2015)	(230 - 79)/(6 - 1)	30.2
163 (5/27/2016)	79 (8/12/2015)	(163 - 79)/(7 - 1)	14
205 (7/12/2016)	79 (8/12/2015)	(205 - 79)/(8 - 1)	18
238 (11/19/2015)	199 (10/15/2015)	(238 - 199)/(3 - 2)	39
228 (1/6/2016)	199 (10/15/2015)	(228 - 199)/(4 - 2)	14.5
247 (2/17/2016)	199 (10/15/2015)	(247 - 199)/(5 - 2)	16
230 (4/6/2016)	199 (10/15/2015)	(230 - 199)/(6 - 2)	7.75
163 (5/27/2016)	199 (10/15/2015)	(163 - 199)/(7 - 2)	-7.2
205 (7/12/2016)	199 (10/15/2015)	(205 - 199)/(8 - 2)	1
228 (1/6/2016)	238 (11/19/2015)	(228 - 238)/(4 - 3)	-10
247 (2/17/2016)	238 (11/19/2015)	(247 - 238)/(5 - 3)	4.5
230 (4/6/2016)	238 (11/19/2015)	(230 - 238)/(6 - 3)	-2.66667
163 (5/27/2016)	238 (11/19/2015)	(163 - 238)/(7 - 3)	-18.75
205 (7/12/2016)	238 (11/19/2015)	(205 - 238)/(8 - 3)	-6.6
247 (2/17/2016)	228 (1/6/2016)	(247 - 228)/(5 - 4)	19
230 (4/6/2016)	228 (1/6/2016)	(230 - 228)/(6 - 4)	1
163 (5/27/2016)	228 (1/6/2016)	(163 - 228)/(7 - 4)	-21.6667
205 (7/12/2016)	228 (1/6/2016)	(205 - 228)/(8 - 4)	-5.75
230 (4/6/2016)	247 (2/17/2016)	(230 - 247)/(6 - 5)	-17
163 (5/27/2016)	247 (2/17/2016)	(163 - 247)/(7 - 5)	-42
205 (7/12/2016)	247 (2/17/2016)	(205 - 247)/(8 - 5)	-14
163 (5/27/2016)	230 (4/6/2016)	(163 - 230)/(7 - 6)	-67
205 (7/12/2016)	230 (4/6/2016)	(205 - 230)/(8 - 6)	-12.5
205 (7/12/2016)	163 (5/27/2016)	(205 - 163)/(8 - 7)	42

Number of Q values = 28

Ordered Q Values

n	Q
1	-67
2	-42

3	-21.6667
4	-18.75
5	-17
6	-14
7	-12.5
8	-10
9	-7.2
10	-6.6
11	-5.75
12	-2.66667
13	1
14	1
15	4.5
16	7.75
17	14
18	14.5
19	16
20	18
21	19
22	30.2
23	39
24	42
25	42
26	49.6667
27	79.5
28	120

Sen's Estimator (Median Q) is 2.75

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -12.5 = Q(7)
Upper limit is 30.2 = Q(22)
-12.5 < 0 < 30.2 indicating no trend in data.

Sen's Slope Analysis

Parameter: Sulfate
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
14 (10/15/2015)	24 J (8/12/2015)	(14 - 24)/(2 - 1)	-10
12.3 (11/19/2015)	24 J (8/12/2015)	(12.3 - 24)/(3 - 1)	-5.85
10 (1/5/2016)	24 J (8/12/2015)	(10 - 24)/(4 - 1)	-4.66667
9.1 (2/16/2016)	24 J (8/12/2015)	(9.1 - 24)/(5 - 1)	-3.725
12.9 (4/7/2016)	24 J (8/12/2015)	(12.9 - 24)/(6 - 1)	-2.22
16.8 (5/27/2016)	24 J (8/12/2015)	(16.8 - 24)/(7 - 1)	-1.2
125 (7/11/2016)	24 J (8/12/2015)	(125 - 24)/(8 - 1)	14.4286
12.3 (11/19/2015)	14 (10/15/2015)	(12.3 - 14)/(3 - 2)	-1.7
10 (1/5/2016)	14 (10/15/2015)	(10 - 14)/(4 - 2)	-2
9.1 (2/16/2016)	14 (10/15/2015)	(9.1 - 14)/(5 - 2)	-1.63333
12.9 (4/7/2016)	14 (10/15/2015)	(12.9 - 14)/(6 - 2)	-0.275
16.8 (5/27/2016)	14 (10/15/2015)	(16.8 - 14)/(7 - 2)	0.56
125 (7/11/2016)	14 (10/15/2015)	(125 - 14)/(8 - 2)	18.5
10 (1/5/2016)	12.3 (11/19/2015)	(10 - 12.3)/(4 - 3)	-2.3
9.1 (2/16/2016)	12.3 (11/19/2015)	(9.1 - 12.3)/(5 - 3)	-1.6
12.9 (4/7/2016)	12.3 (11/19/2015)	(12.9 - 12.3)/(6 - 3)	0.2
16.8 (5/27/2016)	12.3 (11/19/2015)	(16.8 - 12.3)/(7 - 3)	1.125
125 (7/11/2016)	12.3 (11/19/2015)	(125 - 12.3)/(8 - 3)	22.54
9.1 (2/16/2016)	10 (1/5/2016)	(9.1 - 10)/(5 - 4)	-0.9
12.9 (4/7/2016)	10 (1/5/2016)	(12.9 - 10)/(6 - 4)	1.45
16.8 (5/27/2016)	10 (1/5/2016)	(16.8 - 10)/(7 - 4)	2.26667
125 (7/11/2016)	10 (1/5/2016)	(125 - 10)/(8 - 4)	28.75
12.9 (4/7/2016)	9.1 (2/16/2016)	(12.9 - 9.1)/(6 - 5)	3.8
16.8 (5/27/2016)	9.1 (2/16/2016)	(16.8 - 9.1)/(7 - 5)	3.85
125 (7/11/2016)	9.1 (2/16/2016)	(125 - 9.1)/(8 - 5)	38.6333
16.8 (5/27/2016)	12.9 (4/7/2016)	(16.8 - 12.9)/(7 - 6)	3.9
125 (7/11/2016)	12.9 (4/7/2016)	(125 - 12.9)/(8 - 6)	56.05
125 (7/11/2016)	16.8 (5/27/2016)	(125 - 16.8)/(8 - 7)	108.2

Number of Q values = 28

Ordered Q Values

n	Q
1	-10
2	-5.85

3	-4.66667
4	-3.725
5	-2.3
6	-2.22
7	-2
8	-1.7
9	-1.63333
10	-1.6
11	-1.2
12	-0.9
13	-0.275
14	0.2
15	0.56
16	1.125
17	1.45
18	2.26667
19	3.8
20	3.85
21	3.9
22	14.4286
23	18.5
24	22.54
25	28.75
26	38.6333
27	56.05
28	108.2

Sen's Estimator (Median Q) is 0.38

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -2 = Q(7)
Upper limit is 14.4286 = Q(22)
-2 < 0 < 14.4286 indicating no trend in data.

Sen's Slope Analysis

Parameter: Sulfate

Location: MW-6

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
66.1 (10/19/2015)	48 (8/12/2015)	(66.1 - 48)/(2 - 1)	18.1
137 (11/20/2015)	48 (8/12/2015)	(137 - 48)/(3 - 1)	44.5
194 (1/5/2016)	48 (8/12/2015)	(194 - 48)/(4 - 1)	48.6667
87.7 (2/17/2016)	48 (8/12/2015)	(87.7 - 48)/(5 - 1)	9.925
214 (4/5/2016)	48 (8/12/2015)	(214 - 48)/(6 - 1)	33.2
51.6 (5/26/2016)	48 (8/12/2015)	(51.6 - 48)/(7 - 1)	0.6
53.8 (7/11/2016)	48 (8/12/2015)	(53.8 - 48)/(8 - 1)	0.828571
137 (11/20/2015)	66.1 (10/19/2015)	(137 - 66.1)/(3 - 2)	70.9
194 (1/5/2016)	66.1 (10/19/2015)	(194 - 66.1)/(4 - 2)	63.95
87.7 (2/17/2016)	66.1 (10/19/2015)	(87.7 - 66.1)/(5 - 2)	7.2
214 (4/5/2016)	66.1 (10/19/2015)	(214 - 66.1)/(6 - 2)	36.975
51.6 (5/26/2016)	66.1 (10/19/2015)	(51.6 - 66.1)/(7 - 2)	-2.9
53.8 (7/11/2016)	66.1 (10/19/2015)	(53.8 - 66.1)/(8 - 2)	-2.05
194 (1/5/2016)	137 (11/20/2015)	(194 - 137)/(4 - 3)	57
87.7 (2/17/2016)	137 (11/20/2015)	(87.7 - 137)/(5 - 3)	-24.65
214 (4/5/2016)	137 (11/20/2015)	(214 - 137)/(6 - 3)	25.6667
51.6 (5/26/2016)	137 (11/20/2015)	(51.6 - 137)/(7 - 3)	-21.35
53.8 (7/11/2016)	137 (11/20/2015)	(53.8 - 137)/(8 - 3)	-16.64
87.7 (2/17/2016)	194 (1/5/2016)	(87.7 - 194)/(5 - 4)	-106.3
214 (4/5/2016)	194 (1/5/2016)	(214 - 194)/(6 - 4)	10
51.6 (5/26/2016)	194 (1/5/2016)	(51.6 - 194)/(7 - 4)	-47.4667
53.8 (7/11/2016)	194 (1/5/2016)	(53.8 - 194)/(8 - 4)	-35.05
214 (4/5/2016)	87.7 (2/17/2016)	(214 - 87.7)/(6 - 5)	126.3
51.6 (5/26/2016)	87.7 (2/17/2016)	(51.6 - 87.7)/(7 - 5)	-18.05
53.8 (7/11/2016)	87.7 (2/17/2016)	(53.8 - 87.7)/(8 - 5)	-11.3
51.6 (5/26/2016)	214 (4/5/2016)	(51.6 - 214)/(7 - 6)	-162.4
53.8 (7/11/2016)	214 (4/5/2016)	(53.8 - 214)/(8 - 6)	-80.1
53.8 (7/11/2016)	51.6 (5/26/2016)	(53.8 - 51.6)/(8 - 7)	2.2

Number of Q values = 28

Ordered Q Values

n	Q
1	-162.4
2	-106.3

3	-80.1
4	-47.4667
5	-35.05
6	-24.65
7	-21.35
8	-18.05
9	-16.64
10	-11.3
11	-2.9
12	-2.05
13	0.6
14	0.828571
15	2.2
16	7.2
17	9.925
18	10
19	18.1
20	25.6667
21	33.2
22	36.975
23	44.5
24	48.6667
25	57
26	63.95
27	70.9
28	126.3

Sen's Estimator (Median Q) is 1.51429

Time Period	Observations
8/12/2015	1
10/19/2015	1
11/20/2015	1
1/5/2016	1
2/17/2016	1
4/5/2016	1
5/26/2016	1
7/11/2016	1

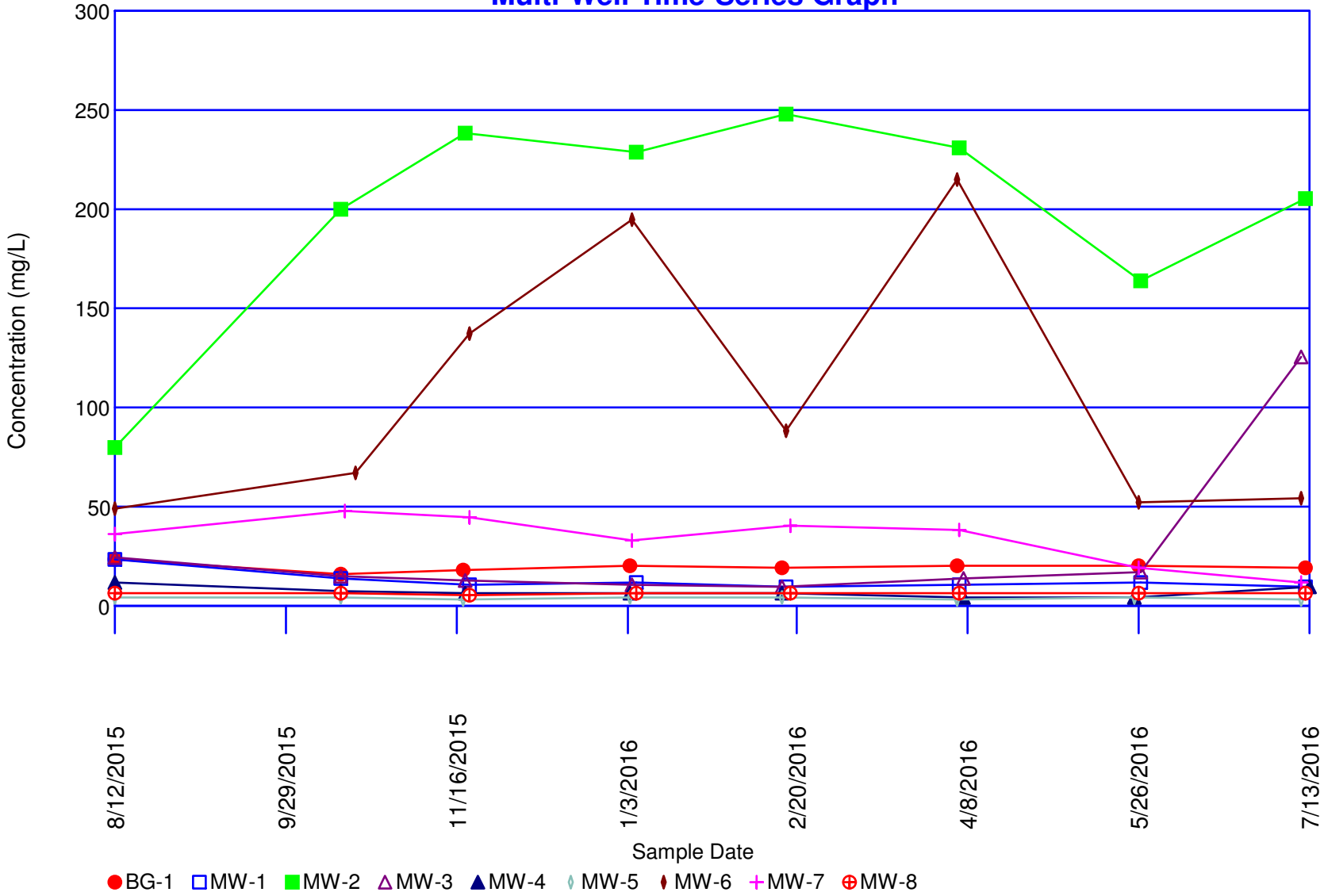
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952

M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -21.35 = Q(7)
Upper limit is 36.975 = Q(22)
-21.35 < 0 < 36.975 indicating no trend in data.

Sulfate

Multi-Well Time-Series Graph



Concentrations (mg/L)

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	0 (0%)	8/12/2015	690 B	690 B
			10/15/2015	654	654
			11/18/2015	652	652
			1/4/2016	643	643
			2/16/2016	650	650
			4/5/2016	628	628
			5/26/2016	633	633
			7/12/2016	668	668

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	0 (0%)	8/12/2015	1500	1500
			10/15/2015	370	370
			11/20/2015	569	569
			1/6/2016	700	700
			2/17/2016	593	593
			4/6/2016	770	770
			5/27/2016	920	920
			7/12/2016	1410	1410
MW-2	8	0 (0%)	8/12/2015	1700	1700
			10/15/2015	2120	2120
			11/19/2015	257	257
			1/6/2016	2480	2480
			2/17/2016	2470	2470
			4/6/2016	2700	2700
			5/27/2016	2870	2870
			7/12/2016	3290	3290
MW-3	8	0 (0%)	8/12/2015	2100	2100
			10/15/2015	2770	2770
			11/19/2015	256	256
			1/5/2016	2490	2490
			2/16/2016	2270	2270
			4/7/2016	2530	2530
			5/27/2016	3180	3180
			7/11/2016	2440	2440

MW-4	8	0 (0%)	8/12/2015	820	820
			10/15/2015	1110	1110
			11/19/2015	395	395
			1/4/2016	806	806
			2/16/2016	800	800
			4/7/2016	513	513
			5/25/2016	486	486
			7/13/2016	1040	1040
MW-5	8	0 (0%)	8/12/2015	230	230
			10/15/2015	296	296
			11/18/2015	235	235
			1/4/2016	259	259
			2/16/2016	263	263
			4/5/2016	194	194
			5/25/2016	229	229
			7/11/2016	221	221
MW-6	8	0 (0%)	8/12/2015	680 B	680 B
			10/19/2015	620	620
			11/20/2015	429	429
			1/5/2016	946	946
			2/17/2016	783	783
			4/5/2016	689	689
			5/26/2016	659	659
			7/11/2016	660	660
MW-7	8	0 (0%)	8/12/2015	1100 B	1100 B
			10/16/2015	890	890
			11/20/2015	129	129
			1/5/2016	1120	1120
			2/18/2016	950	950
			4/6/2016	982	982
			5/26/2016	956	956
			7/11/2016	1100	1100
MW-8	8	0 (0%)	8/12/2015	1300 B	1300 B
			10/15/2015	1560	1560
			11/20/2015	224	224
			1/6/2016	1410	1410
			2/18/2016	1050	1050
			4/6/2016	1130	1130
			5/26/2016	1530	1530
			7/12/2016	1340	1340

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Total Dissolved Solids

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 1084.82

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	7/12/2016	MW-2	3290	2205.18
2	5/27/2016	MW-3	3180	2095.18
3	5/27/2016	MW-2	2870	1785.18
4	10/15/2015	MW-3	2770	1685.18
5	4/6/2016	MW-2	2700	1615.18
6	4/7/2016	MW-3	2530	1445.18
7	1/5/2016	MW-3	2490	1405.18
8	1/6/2016	MW-2	2480	1395.18
9	2/17/2016	MW-2	2470	1385.18
10	7/11/2016	MW-3	2440	1355.18

Iteration i = 9

Mean of 63 measurements = 846.46
Std Dev = 531.376
x(i+1) = 2440 from measurement 7/11/2016 from location MW-3
Rosner Statistic R = |2440 - 846.46|/531.376 = 2.99889
Lambda(72, 10, 0.05) = 3.22
2.99889 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 871.828
Std Dev = 564.857
x(i+1) = 2470 from measurement 2/17/2016 from location MW-2
Rosner Statistic R = |2470 - 871.828|/564.857 = 2.82934
Lambda(72, 9, 0.05) = 3.226
2.82934 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 896.569
Std Dev = 594.867
x(i+1) = 2480 from measurement 1/6/2016 from location MW-2
Rosner Statistic R = |2480 - 896.569|/594.867 = 2.66182
Lambda(72, 8, 0.05) = 3.232
2.66182 < 3.232 -- No outliers detected for i = 7

Iteration i = 6

Mean of 66 measurements = 920.712

Std Dev = 622.007
x(i+1) = 2490 from measurement 1/5/2016 from location MW-3
Rosner Statistic R = |2490 - 920.712|/622.007 = 2.52294
Lambda(72, 7, 0.05) = 3.238
2.52294 < 3.238 -- No outliers detected for i = 6

Iteration i = 5

Mean of 67 measurements = 944.731
Std Dev = 647.83
x(i+1) = 2530 from measurement 4/7/2016 from location MW-3
Rosner Statistic R = |2530 - 944.731|/647.83 = 2.44704
Lambda(72, 6, 0.05) = 3.244
2.44704 < 3.244 -- No outliers detected for i = 5

Iteration i = 4

Mean of 68 measurements = 970.544
Std Dev = 677.295
x(i+1) = 2700 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |2700 - 970.544|/677.295 = 2.55347
Lambda(72, 5, 0.05) = 3.25
2.55347 < 3.25 -- No outliers detected for i = 4

Iteration i = 3

Mean of 69 measurements = 996.623
Std Dev = 706.336
x(i+1) = 2770 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |2770 - 996.623|/706.336 = 2.51067
Lambda(72, 4, 0.05) = 3.25
2.51067 < 3.25 -- No outliers detected for i = 3

Iteration i = 2

Mean of 70 measurements = 1023.39
Std Dev = 736.082
x(i+1) = 2870 from measurement 5/27/2016 from location MW-2
Rosner Statistic R = |2870 - 1023.39|/736.082 = 2.50871
Lambda(72, 3, 0.05) = 3.26
2.50871 < 3.26 -- No outliers detected for i = 2

Iteration i = 1

Mean of 71 measurements = 1053.76
Std Dev = 774.328
x(i+1) = 3180 from measurement 5/27/2016 from location MW-3
Rosner Statistic R = |3180 - 1053.76|/774.328 = 2.74592
Lambda(72, 2, 0.05) = 3.26
2.74592 < 3.26 -- No outliers detected for i = 1

Iteration i = 0

Mean of 72 measurements = 1084.82
Std Dev = 812.769
x(i+1) = 3290 from measurement 7/12/2016 from location MW-2
Rosner Statistic R = |3290 - 1084.82|/812.769 = 2.71317
Lambda(72, 1, 0.05) = 3.27
2.71317 < 3.27 -- No outliers detected for i = 0

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Total Dissolved Solids

Natural Logarithm Transformation

Non-Detects Replaced with Detection Limit

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 6.48003
Background Std Dev = 0.0299759

Number of comparisons = 8
Future Samples (k) = 8
Actual confidence level is 1.0 - (0.05/8) = 99.375 %
t is Percentile of Student's T-Test (0.95/8) = 0.99375
Degrees of Freedom = 8 (background observations) - 1
t(0.99375, 8) = 3.3741

Well MW-1

Date	Samples	Mean	Interval	Significant
7/12/2016	1	7.25134	[0, 6.58731]	TRUE

Well MW-2

Date	Samples	Mean	Interval	Significant
7/12/2016	1	8.09864	[0, 6.58731]	TRUE

Well MW-3

Date	Samples	Mean	Interval	Significant
7/11/2016	1	7.79975	[0, 6.58731]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
7/13/2016	1	6.94698	[0, 6.58731]	TRUE

Well MW-5

Date	Samples	Mean	Interval	Significant
7/11/2016	1	5.39816	[0, 6.58731]	FALSE

Well MW-6

Date	Samples	Mean	Interval	Significant
7/11/2016	1	6.49224	[0, 6.58731]	FALSE

Well MW-7

Date	Samples	Mean	Interval	Significant
7/11/2016	1	7.00307	[0, 6.58731]	TRUE

Well MW-8

Date	Samples	Mean	Interval	Significant
7/12/2016	1	7.20042	[0, 6.58731]	TRUE

Confidence Interval

Parameter: Total Dissolved Solids

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Background Locations

Location	**BG-1**
Mean	652.25
Std Dev	19.7321
Degrees of Freedom	7
Comparison Level	**25**
Untransformed Comp. Level	25

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[631.335, 673.165]	652.25	**TRUE**
95%	1.89458	[639.033, 665.467]	652.25	**TRUE**

Compliance Locations

Location	**MW-1**
Mean	854
Std Dev	404.472
Degrees of Freedom	7
Comparison Level	**125**
Untransformed Comp. Level	125

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[425.286, 1282.71]	854	**TRUE**
95%	1.89458	[583.071, 1124.93]	854	**TRUE**

Location	**MW-2**
Mean	2235.88
Std Dev	930.411
Degrees of Freedom	7
Comparison Level	**250**
Untransformed Comp. Level	250

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[1249.7, 3222.05]	2235.88	**TRUE**
95%	1.89458	[1612.65, 2859.1]	2235.88	**TRUE**

Location	**MW-3**
Mean	2254.5
Std Dev	870.646
Degrees of Freedom	7
Comparison Level	**250**
Untransformed Comp. Level	250

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[1331.67, 3177.33]	2254.5	**TRUE**
95%	1.89458	[1671.31, 2837.69]	2254.5	**TRUE**

Location	**MW-4**
Mean	746.25
Std Dev	260.772
Degrees of Freedom	7
Comparison Level	**250**
Untransformed Comp. Level	250

Confidence	**t-Stat**	**Interval**	**Mid-Point**	**Significant**
99%	2.99795	[469.849, 1022.65]	746.25	**TRUE**
95%	1.89458	[571.576, 920.924]	746.25	**TRUE**

Location	**MW-5**
Mean	240.875
Std Dev	31.0366
Degrees of Freedom	7
Comparison Level	**25**
Untransformed Comp. Level	25

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[207.978, 273.772]	240.875	**TRUE**
95%	1.89458	[220.086, 261.664]	240.875	**TRUE**

Location	**MW-6**
Mean	683.25
Std Dev	145.8
Degrees of Freedom	7
Comparison Level	**25**
Untransformed Comp. Level	25

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[528.711, 837.789]	683.25	**TRUE**
95%	1.89458	[585.588, 780.912]	683.25	**TRUE**

Location	**MW-7**
Mean	903.375
Std Dev	324.083
Degrees of Freedom	7
Comparison Level	**125**
Untransformed Comp. Level	125

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[559.868, 1246.88]	903.375	**TRUE**
95%	1.89458	[686.293, 1120.46]	903.375	**TRUE**

Location	**MW-8**
Mean	1193
Std Dev	429.582
Degrees of Freedom	7
Comparison Level	**125**
Untransformed Comp. Level	125

Confidence	t-Stat	Interval	Mid-Point	Significant
99%	2.99795	[737.671, 1648.33]	1193	**TRUE**
95%	1.89458	[905.251, 1480.75]	1193	**TRUE**

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: MW-1

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
370 (10/15/2015)	1500 (8/12/2015)	(370 - 1500)/(2 - 1)	-1130
569 (11/20/2015)	1500 (8/12/2015)	(569 - 1500)/(3 - 1)	-465.5
700 (1/6/2016)	1500 (8/12/2015)	(700 - 1500)/(4 - 1)	-266.667
593 (2/17/2016)	1500 (8/12/2015)	(593 - 1500)/(5 - 1)	-226.75
770 (4/6/2016)	1500 (8/12/2015)	(770 - 1500)/(6 - 1)	-146
920 (5/27/2016)	1500 (8/12/2015)	(920 - 1500)/(7 - 1)	-96.6667
1410 (7/12/2016)	1500 (8/12/2015)	(1410 - 1500)/(8 - 1)	-12.8571
569 (11/20/2015)	370 (10/15/2015)	(569 - 370)/(3 - 2)	199
700 (1/6/2016)	370 (10/15/2015)	(700 - 370)/(4 - 2)	165
593 (2/17/2016)	370 (10/15/2015)	(593 - 370)/(5 - 2)	74.3333
770 (4/6/2016)	370 (10/15/2015)	(770 - 370)/(6 - 2)	100
920 (5/27/2016)	370 (10/15/2015)	(920 - 370)/(7 - 2)	110
1410 (7/12/2016)	370 (10/15/2015)	(1410 - 370)/(8 - 2)	173.333
700 (1/6/2016)	569 (11/20/2015)	(700 - 569)/(4 - 3)	131
593 (2/17/2016)	569 (11/20/2015)	(593 - 569)/(5 - 3)	12
770 (4/6/2016)	569 (11/20/2015)	(770 - 569)/(6 - 3)	67
920 (5/27/2016)	569 (11/20/2015)	(920 - 569)/(7 - 3)	87.75
1410 (7/12/2016)	569 (11/20/2015)	(1410 - 569)/(8 - 3)	168.2
593 (2/17/2016)	700 (1/6/2016)	(593 - 700)/(5 - 4)	-107
770 (4/6/2016)	700 (1/6/2016)	(770 - 700)/(6 - 4)	35
920 (5/27/2016)	700 (1/6/2016)	(920 - 700)/(7 - 4)	73.3333
1410 (7/12/2016)	700 (1/6/2016)	(1410 - 700)/(8 - 4)	177.5
770 (4/6/2016)	593 (2/17/2016)	(770 - 593)/(6 - 5)	177
920 (5/27/2016)	593 (2/17/2016)	(920 - 593)/(7 - 5)	163.5
1410 (7/12/2016)	593 (2/17/2016)	(1410 - 593)/(8 - 5)	272.333
920 (5/27/2016)	770 (4/6/2016)	(920 - 770)/(7 - 6)	150
1410 (7/12/2016)	770 (4/6/2016)	(1410 - 770)/(8 - 6)	320
1410 (7/12/2016)	920 (5/27/2016)	(1410 - 920)/(8 - 7)	490

Number of Q values = 28

Ordered Q Values

n	Q
1	-1130
2	-465.5
3	-266.667
4	-226.75
5	-146
6	-107
7	-96.6667
8	-12.8571
9	12
10	35
11	67
12	73.3333
13	74.3333
14	87.75
15	100
16	110
17	131
18	150
19	163.5
20	165
21	168.2
22	173.333

23	177
24	177.5
25	199
26	272.333
27	320
28	490

Sen's Estimator (Median Q) is 93.875

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -96.6667 = Q(7)
Upper limit is 173.333 = Q(22)
-96.6667 < 0 < 173.333 indicating no trend in data.

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: MW-2

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2120 (10/15/2015)	1700 (8/12/2015)	(2120 - 1700)/(2 - 1)	420
257 (11/19/2015)	1700 (8/12/2015)	(257 - 1700)/(3 - 1)	-721.5
2480 (1/6/2016)	1700 (8/12/2015)	(2480 - 1700)/(4 - 1)	260
2470 (2/17/2016)	1700 (8/12/2015)	(2470 - 1700)/(5 - 1)	192.5
2700 (4/6/2016)	1700 (8/12/2015)	(2700 - 1700)/(6 - 1)	200
2870 (5/27/2016)	1700 (8/12/2015)	(2870 - 1700)/(7 - 1)	195
3290 (7/12/2016)	1700 (8/12/2015)	(3290 - 1700)/(8 - 1)	227.143
257 (11/19/2015)	2120 (10/15/2015)	(257 - 2120)/(3 - 2)	-1863
2480 (1/6/2016)	2120 (10/15/2015)	(2480 - 2120)/(4 - 2)	180
2470 (2/17/2016)	2120 (10/15/2015)	(2470 - 2120)/(5 - 2)	116.667
2700 (4/6/2016)	2120 (10/15/2015)	(2700 - 2120)/(6 - 2)	145
2870 (5/27/2016)	2120 (10/15/2015)	(2870 - 2120)/(7 - 2)	150
3290 (7/12/2016)	2120 (10/15/2015)	(3290 - 2120)/(8 - 2)	195
2480 (1/6/2016)	257 (11/19/2015)	(2480 - 257)/(4 - 3)	2223
2470 (2/17/2016)	257 (11/19/2015)	(2470 - 257)/(5 - 3)	1106.5
2700 (4/6/2016)	257 (11/19/2015)	(2700 - 257)/(6 - 3)	814.333
2870 (5/27/2016)	257 (11/19/2015)	(2870 - 257)/(7 - 3)	653.25
3290 (7/12/2016)	257 (11/19/2015)	(3290 - 257)/(8 - 3)	606.6
2470 (2/17/2016)	2480 (1/6/2016)	(2470 - 2480)/(5 - 4)	-10
2700 (4/6/2016)	2480 (1/6/2016)	(2700 - 2480)/(6 - 4)	110
2870 (5/27/2016)	2480 (1/6/2016)	(2870 - 2480)/(7 - 4)	130
3290 (7/12/2016)	2480 (1/6/2016)	(3290 - 2480)/(8 - 4)	202.5
2700 (4/6/2016)	2470 (2/17/2016)	(2700 - 2470)/(6 - 5)	230
2870 (5/27/2016)	2470 (2/17/2016)	(2870 - 2470)/(7 - 5)	200
3290 (7/12/2016)	2470 (2/17/2016)	(3290 - 2470)/(8 - 5)	273.333
2870 (5/27/2016)	2700 (4/6/2016)	(2870 - 2700)/(7 - 6)	170
3290 (7/12/2016)	2700 (4/6/2016)	(3290 - 2700)/(8 - 6)	295
3290 (7/12/2016)	2870 (5/27/2016)	(3290 - 2870)/(8 - 7)	420

Number of Q values = 28

Ordered Q Values

n	Q
1	-1863
2	-721.5
3	-10
4	110
5	116.667
6	130
7	145
8	150
9	170
10	180
11	192.5
12	195
13	195
14	200
15	200
16	202.5
17	227.143
18	230
19	260
20	273.333
21	295
22	420

23	420
24	606.6
25	653.25
26	814.333
27	1106.5
28	2223

Sen's Estimator (Median Q) is 200

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 145 = Q(7)
Upper limit is 420 = Q(22)
145 > 0 indicating an upward trend in data.

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: MW-3

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2770 (10/15/2015)	2100 (8/12/2015)	(2770 - 2100)/(2 - 1)	670
256 (11/19/2015)	2100 (8/12/2015)	(256 - 2100)/(3 - 1)	-922
2490 (1/5/2016)	2100 (8/12/2015)	(2490 - 2100)/(4 - 1)	130
2270 (2/16/2016)	2100 (8/12/2015)	(2270 - 2100)/(5 - 1)	42.5
2530 (4/7/2016)	2100 (8/12/2015)	(2530 - 2100)/(6 - 1)	86
3180 (5/27/2016)	2100 (8/12/2015)	(3180 - 2100)/(7 - 1)	180
2440 (7/11/2016)	2100 (8/12/2015)	(2440 - 2100)/(8 - 1)	48.5714
256 (11/19/2015)	2770 (10/15/2015)	(256 - 2770)/(3 - 2)	-2514
2490 (1/5/2016)	2770 (10/15/2015)	(2490 - 2770)/(4 - 2)	-140
2270 (2/16/2016)	2770 (10/15/2015)	(2270 - 2770)/(5 - 2)	-166.667
2530 (4/7/2016)	2770 (10/15/2015)	(2530 - 2770)/(6 - 2)	-60
3180 (5/27/2016)	2770 (10/15/2015)	(3180 - 2770)/(7 - 2)	82
2440 (7/11/2016)	2770 (10/15/2015)	(2440 - 2770)/(8 - 2)	-55
2490 (1/5/2016)	256 (11/19/2015)	(2490 - 256)/(4 - 3)	2234
2270 (2/16/2016)	256 (11/19/2015)	(2270 - 256)/(5 - 3)	1007
2530 (4/7/2016)	256 (11/19/2015)	(2530 - 256)/(6 - 3)	758
3180 (5/27/2016)	256 (11/19/2015)	(3180 - 256)/(7 - 3)	731
2440 (7/11/2016)	256 (11/19/2015)	(2440 - 256)/(8 - 3)	436.8
2270 (2/16/2016)	2490 (1/5/2016)	(2270 - 2490)/(5 - 4)	-220
2530 (4/7/2016)	2490 (1/5/2016)	(2530 - 2490)/(6 - 4)	20
3180 (5/27/2016)	2490 (1/5/2016)	(3180 - 2490)/(7 - 4)	230
2440 (7/11/2016)	2490 (1/5/2016)	(2440 - 2490)/(8 - 4)	-12.5
2530 (4/7/2016)	2270 (2/16/2016)	(2530 - 2270)/(6 - 5)	260
3180 (5/27/2016)	2270 (2/16/2016)	(3180 - 2270)/(7 - 5)	455
2440 (7/11/2016)	2270 (2/16/2016)	(2440 - 2270)/(8 - 5)	56.6667
3180 (5/27/2016)	2530 (4/7/2016)	(3180 - 2530)/(7 - 6)	650
2440 (7/11/2016)	2530 (4/7/2016)	(2440 - 2530)/(8 - 6)	-45
2440 (7/11/2016)	3180 (5/27/2016)	(2440 - 3180)/(8 - 7)	-740

Number of Q values = 28

Ordered Q Values

n	Q
1	-2514
2	-922
3	-740
4	-220
5	-166.667
6	-140
7	-60
8	-55
9	-45
10	-12.5
11	20
12	42.5
13	48.5714
14	56.6667
15	82
16	86
17	130
18	180
19	230
20	260
21	436.8
22	455

23	650
24	670
25	731
26	758
27	1007
28	2234

Sen's Estimator (Median Q) is 69.3333

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/5/2016	1
2/16/2016	1
4/7/2016	1
5/27/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -60 = Q(7)
Upper limit is 455 = Q(22)
-60 < 0 < 455 indicating no trend in data.

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: MW-4

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1110 (10/15/2015)	820 (8/12/2015)	(1110 - 820)/(2 - 1)	290
395 (11/19/2015)	820 (8/12/2015)	(395 - 820)/(3 - 1)	-212.5
806 (1/4/2016)	820 (8/12/2015)	(806 - 820)/(4 - 1)	-4.66667
800 (2/16/2016)	820 (8/12/2015)	(800 - 820)/(5 - 1)	-5
513 (4/7/2016)	820 (8/12/2015)	(513 - 820)/(6 - 1)	-61.4
486 (5/25/2016)	820 (8/12/2015)	(486 - 820)/(7 - 1)	-55.6667
1040 (7/13/2016)	820 (8/12/2015)	(1040 - 820)/(8 - 1)	31.4286
395 (11/19/2015)	1110 (10/15/2015)	(395 - 1110)/(3 - 2)	-715
806 (1/4/2016)	1110 (10/15/2015)	(806 - 1110)/(4 - 2)	-152
800 (2/16/2016)	1110 (10/15/2015)	(800 - 1110)/(5 - 2)	-103.333
513 (4/7/2016)	1110 (10/15/2015)	(513 - 1110)/(6 - 2)	-149.25
486 (5/25/2016)	1110 (10/15/2015)	(486 - 1110)/(7 - 2)	-124.8
1040 (7/13/2016)	1110 (10/15/2015)	(1040 - 1110)/(8 - 2)	-11.6667
806 (1/4/2016)	395 (11/19/2015)	(806 - 395)/(4 - 3)	411
800 (2/16/2016)	395 (11/19/2015)	(800 - 395)/(5 - 3)	202.5
513 (4/7/2016)	395 (11/19/2015)	(513 - 395)/(6 - 3)	39.3333
486 (5/25/2016)	395 (11/19/2015)	(486 - 395)/(7 - 3)	22.75
1040 (7/13/2016)	395 (11/19/2015)	(1040 - 395)/(8 - 3)	129
800 (2/16/2016)	806 (1/4/2016)	(800 - 806)/(5 - 4)	-6
513 (4/7/2016)	806 (1/4/2016)	(513 - 806)/(6 - 4)	-146.5
486 (5/25/2016)	806 (1/4/2016)	(486 - 806)/(7 - 4)	-106.667
1040 (7/13/2016)	806 (1/4/2016)	(1040 - 806)/(8 - 4)	58.5
513 (4/7/2016)	800 (2/16/2016)	(513 - 800)/(6 - 5)	-287
486 (5/25/2016)	800 (2/16/2016)	(486 - 800)/(7 - 5)	-157
1040 (7/13/2016)	800 (2/16/2016)	(1040 - 800)/(8 - 5)	80
486 (5/25/2016)	513 (4/7/2016)	(486 - 513)/(7 - 6)	-27
1040 (7/13/2016)	513 (4/7/2016)	(1040 - 513)/(8 - 6)	263.5
1040 (7/13/2016)	486 (5/25/2016)	(1040 - 486)/(8 - 7)	554

Number of Q values = 28

Ordered Q Values

n	Q
1	-715
2	-287
3	-212.5
4	-157
5	-152
6	-149.25
7	-146.5
8	-124.8
9	-106.667
10	-103.333
11	-61.4
12	-55.6667
13	-27
14	-11.6667
15	-6
16	-5
17	-4.66667
18	22.75
19	31.4286
20	39.3333
21	58.5
22	80

23	129
24	202.5
25	263.5
26	290
27	411
28	554

Sen's Estimator (Median Q) is -8.83333

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/4/2016	1
2/16/2016	1
4/7/2016	1
5/25/2016	1
7/13/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -146.5 = Q(7)
Upper limit is 80 = Q(22)
-146.5 < 0 < 80 indicating no trend in data.

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: MW-7

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
890 (10/16/2015)	1100 B (8/12/2015)	(890 - 1100)/(2 - 1)	-210
129 (11/20/2015)	1100 B (8/12/2015)	(129 - 1100)/(3 - 1)	-485.5
1120 (1/5/2016)	1100 B (8/12/2015)	(1120 - 1100)/(4 - 1)	6.66667
950 (2/18/2016)	1100 B (8/12/2015)	(950 - 1100)/(5 - 1)	-37.5
982 (4/6/2016)	1100 B (8/12/2015)	(982 - 1100)/(6 - 1)	-23.6
956 (5/26/2016)	1100 B (8/12/2015)	(956 - 1100)/(7 - 1)	-24
1100 (7/11/2016)	1100 B (8/12/2015)	(1100 - 1100)/(8 - 1)	0
129 (11/20/2015)	890 (10/16/2015)	(129 - 890)/(3 - 2)	-761
1120 (1/5/2016)	890 (10/16/2015)	(1120 - 890)/(4 - 2)	115
950 (2/18/2016)	890 (10/16/2015)	(950 - 890)/(5 - 2)	20
982 (4/6/2016)	890 (10/16/2015)	(982 - 890)/(6 - 2)	23
956 (5/26/2016)	890 (10/16/2015)	(956 - 890)/(7 - 2)	13.2
1100 (7/11/2016)	890 (10/16/2015)	(1100 - 890)/(8 - 2)	35
1120 (1/5/2016)	129 (11/20/2015)	(1120 - 129)/(4 - 3)	991
950 (2/18/2016)	129 (11/20/2015)	(950 - 129)/(5 - 3)	410.5
982 (4/6/2016)	129 (11/20/2015)	(982 - 129)/(6 - 3)	284.333
956 (5/26/2016)	129 (11/20/2015)	(956 - 129)/(7 - 3)	206.75
1100 (7/11/2016)	129 (11/20/2015)	(1100 - 129)/(8 - 3)	194.2
950 (2/18/2016)	1120 (1/5/2016)	(950 - 1120)/(5 - 4)	-170
982 (4/6/2016)	1120 (1/5/2016)	(982 - 1120)/(6 - 4)	-69
956 (5/26/2016)	1120 (1/5/2016)	(956 - 1120)/(7 - 4)	-54.6667
1100 (7/11/2016)	1120 (1/5/2016)	(1100 - 1120)/(8 - 4)	-5
982 (4/6/2016)	950 (2/18/2016)	(982 - 950)/(6 - 5)	32
956 (5/26/2016)	950 (2/18/2016)	(956 - 950)/(7 - 5)	3
1100 (7/11/2016)	950 (2/18/2016)	(1100 - 950)/(8 - 5)	50
956 (5/26/2016)	982 (4/6/2016)	(956 - 982)/(7 - 6)	-26
1100 (7/11/2016)	982 (4/6/2016)	(1100 - 982)/(8 - 6)	59
1100 (7/11/2016)	956 (5/26/2016)	(1100 - 956)/(8 - 7)	144

Number of Q values = 28

Ordered Q Values

n	Q
1	-761
2	-485.5
3	-210
4	-170
5	-69
6	-54.6667
7	-37.5
8	-26
9	-24
10	-23.6
11	-5
12	0
13	3
14	6.66667
15	13.2
16	20
17	23
18	32
19	35
20	50
21	59
22	115

23	144
24	194.2
25	206.75
26	284.333
27	410.5
28	991

Sen's Estimator (Median Q) is 9.93333

Tied Group	Value	Members
1	1100	2

Time Period	Observations
8/12/2015	1
10/16/2015	1
11/20/2015	1
1/5/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -37.5 = Q(7)
Upper limit is 115 = Q(22)
-37.5 < 0 < 115 indicating no trend in data.

Sen's Slope Analysis

Parameter: Total Dissolved Solids
Location: MW-8

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1560 (10/15/2015)	1300 B (8/12/2015)	(1560 - 1300)/(2 - 1)	260
224 (11/20/2015)	1300 B (8/12/2015)	(224 - 1300)/(3 - 1)	-538
1410 (1/6/2016)	1300 B (8/12/2015)	(1410 - 1300)/(4 - 1)	36.6667
1050 (2/18/2016)	1300 B (8/12/2015)	(1050 - 1300)/(5 - 1)	-62.5
1130 (4/6/2016)	1300 B (8/12/2015)	(1130 - 1300)/(6 - 1)	-34
1530 (5/26/2016)	1300 B (8/12/2015)	(1530 - 1300)/(7 - 1)	38.3333
1340 (7/12/2016)	1300 B (8/12/2015)	(1340 - 1300)/(8 - 1)	5.71429
224 (11/20/2015)	1560 (10/15/2015)	(224 - 1560)/(3 - 2)	-1336
1410 (1/6/2016)	1560 (10/15/2015)	(1410 - 1560)/(4 - 2)	-75
1050 (2/18/2016)	1560 (10/15/2015)	(1050 - 1560)/(5 - 2)	-170
1130 (4/6/2016)	1560 (10/15/2015)	(1130 - 1560)/(6 - 2)	-107.5
1530 (5/26/2016)	1560 (10/15/2015)	(1530 - 1560)/(7 - 2)	-6
1340 (7/12/2016)	1560 (10/15/2015)	(1340 - 1560)/(8 - 2)	-36.6667
1410 (1/6/2016)	224 (11/20/2015)	(1410 - 224)/(4 - 3)	1186
1050 (2/18/2016)	224 (11/20/2015)	(1050 - 224)/(5 - 3)	413
1130 (4/6/2016)	224 (11/20/2015)	(1130 - 224)/(6 - 3)	302
1530 (5/26/2016)	224 (11/20/2015)	(1530 - 224)/(7 - 3)	326.5
1340 (7/12/2016)	224 (11/20/2015)	(1340 - 224)/(8 - 3)	223.2
1050 (2/18/2016)	1410 (1/6/2016)	(1050 - 1410)/(5 - 4)	-360
1130 (4/6/2016)	1410 (1/6/2016)	(1130 - 1410)/(6 - 4)	-140
1530 (5/26/2016)	1410 (1/6/2016)	(1530 - 1410)/(7 - 4)	40
1340 (7/12/2016)	1410 (1/6/2016)	(1340 - 1410)/(8 - 4)	-17.5
1130 (4/6/2016)	1050 (2/18/2016)	(1130 - 1050)/(6 - 5)	80
1530 (5/26/2016)	1050 (2/18/2016)	(1530 - 1050)/(7 - 5)	240
1340 (7/12/2016)	1050 (2/18/2016)	(1340 - 1050)/(8 - 5)	96.6667
1530 (5/26/2016)	1130 (4/6/2016)	(1530 - 1130)/(7 - 6)	400
1340 (7/12/2016)	1130 (4/6/2016)	(1340 - 1130)/(8 - 6)	105
1340 (7/12/2016)	1530 (5/26/2016)	(1340 - 1530)/(8 - 7)	-190

Number of Q values = 28

Ordered Q Values

n	Q
1	-1336
2	-538
3	-360
4	-190
5	-170
6	-140
7	-107.5
8	-75
9	-62.5
10	-36.6667
11	-34
12	-17.5
13	-6
14	5.71429
15	36.6667
16	38.3333
17	40
18	80
19	96.6667
20	105
21	223.2
22	240

23	260
24	302
25	326.5
26	400
27	413
28	1186

Sen's Estimator (Median Q) is 21.1905

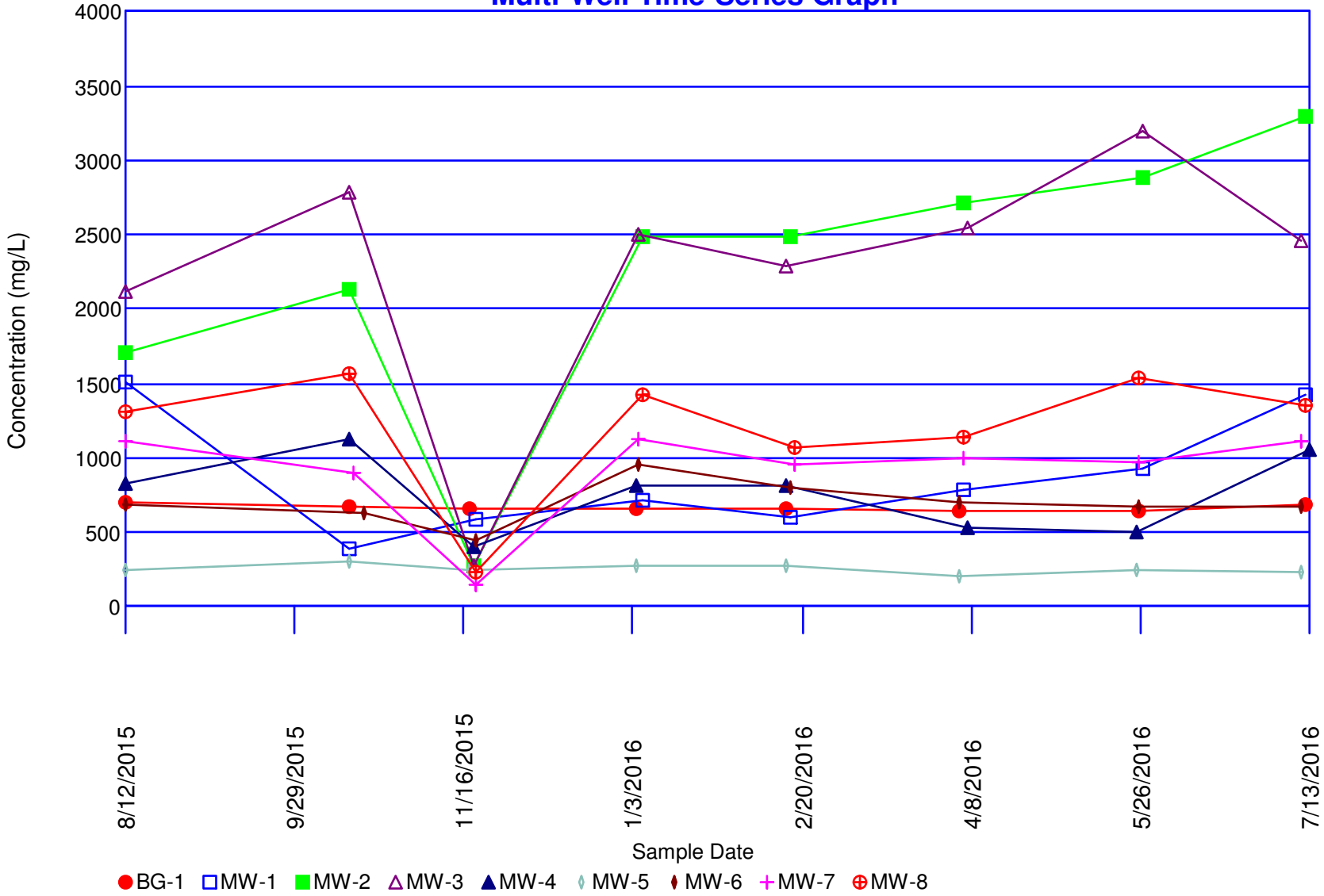
Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -107.5 = Q(7)
Upper limit is 240 = Q(22)
-107.5 < 0 < 240 indicating no trend in data.

Total Dissolved Solids

Multi-Well Time-Series Graph



Concentrations (ug/L)

Parameter: Zinc

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 72
Total Non-Detect: 38
Percent Non-Detects: 52.7778%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
BG-1	8	6 (75%)	8/12/2015	8.3 J	8.3 J
			10/15/2015	10	10
			11/18/2015	ND<10 U	ND<10 U
			1/4/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/5/2016	ND<10 U	ND<10 U
			5/26/2016	ND<10 U	ND<10 U
			7/12/2016	ND<10 U	ND<10 U

There are 8 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	3 (37.5%)	8/12/2015	7 J	7 J
			10/15/2015	12.4	12.4
			11/20/2015	ND<10 U	ND<10 U
			1/6/2016	13.3	13.3
			2/17/2016	ND<10 U	ND<10 U
			4/6/2016	10.2	10.2
			5/27/2016	ND<10 U	ND<10 U
			7/12/2016	13.2	13.2
MW-2	8	2 (25%)	8/12/2015	13	13
			10/15/2015	26.8	26.8
			11/19/2015	50.7	50.7
			1/6/2016	ND<10 U	ND<10 U
			2/17/2016	27.2	27.2
			4/6/2016	113	113
			5/27/2016	ND<10 U	ND<10 U
			7/12/2016	37.9	37.9
MW-3	8	5 (62.5%)	8/12/2015	5.2 J	5.2 J
			10/15/2015	41.8	41.8
			11/19/2015	ND<10 U	ND<10 U
			1/5/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/7/2016	12.5	12.5
			5/27/2016	ND<10 U	ND<10 U
			7/11/2016	ND<10 U	ND<10 U

MW-4	8	7 (87.5%)	8/12/2015	31	31
			10/15/2015	ND<10 U	ND<10 U
			11/19/2015	ND<10 U	ND<10 U
			1/4/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/7/2016	ND<10 U	ND<10 U
			5/25/2016	ND<10 U	ND<10 U
			7/13/2016	ND<10 U	ND<10 U
MW-5	8	4 (50%)	8/12/2015	16	16
			10/15/2015	106	106
			11/18/2015	ND<10 U	ND<10 U
			1/4/2016	ND<10 U	ND<10 U
			2/16/2016	ND<10 U	ND<10 U
			4/5/2016	36.1	36.1
			5/25/2016	ND<10 U	ND<10 U
			7/11/2016	21.2	21.2
MW-6	8	4 (50%)	8/12/2015	6 J	6 J
			10/19/2015	11.5	11.5
			11/20/2015	ND<10 U	ND<10 U
			1/5/2016	11.3	11.3
			2/17/2016	ND<10 U	ND<10 U
			4/5/2016	ND<10 U	ND<10 U
			5/26/2016	ND<10 U	ND<10 U
			7/11/2016	11.8	11.8
MW-7	8	6 (75%)	8/12/2015	4.4 J	4.4 J
			10/16/2015	18.6	18.6
			11/20/2015	ND<10 U	ND<10 U
			1/5/2016	ND<10 U	ND<10 U
			2/18/2016	ND<10 U	ND<10 U
			4/6/2016	ND<10 U	ND<10 U
			5/26/2016	ND<10 U	ND<10 U
			7/11/2016	ND<10 U	ND<10 U
MW-8	8	1 (12.5%)	8/12/2015	5.1 J	5.1 J
			10/15/2015	12	12
			11/20/2015	22.1	22.1
			1/6/2016	18.7	18.7
			2/18/2016	14.6	14.6
			4/6/2016	47.7	47.7
			5/26/2016	ND<10 U	ND<10 U
			7/12/2016	17.8	17.8

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: Zinc

All Locations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 16.5889

10 most extreme of 72 measurements

by order of magnitude difference from the mean

1	4/6/2016	MW-2	113	96.4111
2	10/15/2015	MW-5	106	89.4111
3	11/19/2015	MW-2	50.7	34.1111
4	4/6/2016	MW-8	47.7	31.1111
5	10/15/2015	MW-3	41.8	25.2111
6	7/12/2016	MW-2	37.9	21.3111
7	4/5/2016	MW-5	36.1	19.5111
8	8/12/2015	MW-4	31	14.4111
9	8/12/2015	MW-7	4.4 J	-12.1889
10	8/12/2015	MW-8	5.1 J	-11.4889

Iteration i = 9

Mean of 63 measurements = 11.5206
Std Dev = 4.21251
x(i+1) = 5.1 from measurement 8/12/2015 from location MW-8
Rosner Statistic R = |5.1 - 11.5206|/4.21251 = 1.52418
Lambda(72, 10, 0.05) = 3.22
1.52418 < 3.22 -- No outliers detected for i = 9

Iteration i = 8

Mean of 64 measurements = 11.4094
Std Dev = 4.27268
x(i+1) = 4.4 from measurement 8/12/2015 from location MW-7
Rosner Statistic R = |4.4 - 11.4094|/4.27268 = 1.64051
Lambda(72, 9, 0.05) = 3.226
1.64051 < 3.226 -- No outliers detected for i = 8

Iteration i = 7

Mean of 65 measurements = 11.7108
Std Dev = 4.88621
x(i+1) = 31 from measurement 8/12/2015 from location MW-4
Rosner Statistic R = |31 - 11.7108|/4.88621 = 3.94769
Lambda(72, 8, 0.05) = 3.232
3.94769 > 3.232 -- Measurement 8/12/2015 for location MW-4 is an outlier

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Iteration i = 6

Mean of 66 measurements = 12.0803

Std Dev = 5.70266
x(i+1) = 36.1 from measurement 4/5/2016 from location MW-5
Rosner Statistic R = |36.1 - 12.0803|/5.70266 = 4.21201
Lambda(72, 7, 0.05) = 3.238
Measurement 4/5/2016 for location MW-5 is an outlier

Iteration i = 5

Mean of 67 measurements = 12.4657
Std Dev = 6.47902
x(i+1) = 37.9 from measurement 7/12/2016 from location MW-2
Rosner Statistic R = |37.9 - 12.4657|/6.47902 = 3.92564
Lambda(72, 6, 0.05) = 3.244
Measurement 7/12/2016 for location MW-2 is an outlier

Iteration i = 4

Mean of 68 measurements = 12.8971
Std Dev = 7.34885
x(i+1) = 41.8 from measurement 10/15/2015 from location MW-3
Rosner Statistic R = |41.8 - 12.8971|/7.34885 = 3.93299
Lambda(72, 5, 0.05) = 3.25
Measurement 10/15/2015 for location MW-3 is an outlier

Iteration i = 3

Mean of 69 measurements = 13.4014
Std Dev = 8.41224
x(i+1) = 47.7 from measurement 4/6/2016 from location MW-8
Rosner Statistic R = |47.7 - 13.4014|/8.41224 = 4.07722
Lambda(72, 4, 0.05) = 3.25
Measurement 4/6/2016 for location MW-8 is an outlier

Iteration i = 2

Mean of 70 measurements = 13.9343
Std Dev = 9.46648
x(i+1) = 50.7 from measurement 11/19/2015 from location MW-2
Rosner Statistic R = |50.7 - 13.9343|/9.46648 = 3.88378
Lambda(72, 3, 0.05) = 3.26
Measurement 11/19/2015 for location MW-2 is an outlier

Iteration i = 1

Mean of 71 measurements = 15.231
Std Dev = 14.4123
x(i+1) = 106 from measurement 10/15/2015 from location MW-5
Rosner Statistic R = |106 - 15.231|/14.4123 = 6.29801
Lambda(72, 2, 0.05) = 3.26
Measurement 10/15/2015 for location MW-5 is an outlier

Iteration i = 0

Mean of 72 measurements = 16.5889
Std Dev = 18.3726
x(i+1) = 113 from measurement 4/6/2016 from location MW-2
Rosner Statistic R = |113 - 16.5889|/18.3726 = 5.24756
Lambda(72, 1, 0.05) = 3.27
Measurement 4/6/2016 for location MW-2 is an outlier

	A	B	C	D	E	F	G	H	I	J	K	L
1				Background Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	8/29/2016 11:25:04 AM								
4			From File	Charah-ProUCL-Aug-2016.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	95%								
7			Coverage	95%								
8			Different or Future K Observations	1								
9			Number of Bootstrap Operations	2000								
10												
11					Zn (bg-1)							
12												
13					General Statistics							
14					Total Number of Observations	8			Number of Missing Observations			0
15					Number of Distinct Observations	2						
16					Number of Detects	2			Number of Non-Detects			6
17					Number of Distinct Detects	2			Number of Distinct Non-Detects			1
18					Minimum Detect	8.3			Minimum Non-Detect			10
19					Maximum Detect	10			Maximum Non-Detect			10
20					Variance Detected	1.445			Percent Non-Detects			75%
21					Mean Detected	9.15			SD Detected			1.202
22					Mean of Detected Logged Data	2.209			SD of Detected Logged Data			0.132
23												
24					Warning: Data set has only 2 Detected Values.							
25					This is not enough to compute meaningful or reliable statistics and estimates.							
26												
27												
28					Critical Values for Background Threshold Values (BTVs)							
29					Tolerance Factor K (For UTL)	3.187			d2max (for USL)			2.032
30												
31					Normal GOF Test on Detects Only							
32					Not Enough Data to Perform GOF Test							
33												
34					Kaplan Meier (KM) Background Statistics Assuming Normal Distribution							
35					Mean	8.513			SD			0.562
36					95% UTL95% Coverage	10.3			95% KM UPL (t)			9.642
37					90% KM Percentile (z)	9.233			95% KM Percentile (z)			9.437
38					99% KM Percentile (z)	9.82			95% KM USL			9.655
39												
40					DL/2 Substitution Background Statistics Assuming Normal Distribution							
41					Mean	6.038			SD			1.974
42					95% UTL95% Coverage	12.33			95% UPL (t)			10
43					90% Percentile (z)	8.567			95% Percentile (z)			9.285
44					99% Percentile (z)	10.63			95% USL			10.05
45					DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons							
46												
47					Gamma GOF Tests on Detected Observations Only							
48					Not Enough Data to Perform GOF Test							
49												
50					Gamma Statistics on Detected Data Only							
51					k hat (MLE)	115.5			k star (bias corrected MLE)			N/A
52					Theta hat (MLE)	0.0792			Theta star (bias corrected MLE)			N/A
53					nu hat (MLE)	462.2			nu star (bias corrected)			N/A
54					MLE Mean (bias corrected)	N/A						
55					MLE Sd (bias corrected)	N/A			95% Percentile of Chisquare (2k)			N/A
56												
57					The following statistics are computed using gamma distribution and KM estimates							
58					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
59					k hat (KM)	229.2					nu hat (KM)	3668
60					WH	HW					WH	HW
61				95% Approx. Gamma UTL with 95% Coverage	10.33	10.33			95% Approx. Gamma UPL		9.625	9.622
62				95% Gamma USL	9.638	9.635						

	A	B	C	D	E	F	G	H	I	J	K	L
63												
64	**Lognormal GOF Test on Detected Observations Only**											
65	**Not Enough Data to Perform GOF Test**											
66												
67	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
68					Mean in Original Scale	8.503				Mean in Log Scale		2.137
69					SD in Original Scale	0.792				SD in Log Scale		0.0913
70					95% UTL95% Coverage	11.33				95% BCA UTL95% Coverage		10
71					95% Bootstrap (%) UTL95% Coverage	10				95% UPL (t)		10.18
72					90% Percentile (z)	9.523				95% Percentile (z)		9.844
73					99% Percentile (z)	10.48				95% USL		10.2
74												
75	**Background DL/2 Statistics Assuming Lognormal Distribution**											
76					Mean in Original Scale	6.038				Mean in Log Scale		1.759
77					SD in Original Scale	1.974				SD in Log Scale		0.282
78					95% UTL95% Coverage	14.28				95% UPL (t)		10.24
79					90% Percentile (z)	8.34				95% Percentile (z)		9.24
80					99% Percentile (z)	11.2				95% USL		10.31
81	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
82												
83	**Nonparametric Distribution Free Background Statistics**											
84	**Data do not follow a Discernible Distribution (0.05)**											
85												
86	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
87					Order of Statistic, r	8				95% UTL with95% Coverage		10
88					Approximate f	0.421				Confidence Coefficient (CC) achieved by UTL		0.337
89					95% UPL	10				95% USL		10
90					95% KM Chebyshev UPL	11.11						
91												
92	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
93	data set free of outliers and consists of observations collected from clean unimpacted locations.											
94	The use of USL tends to provide a balance between false positives and false negatives provided the data											
95	represents a background data set and when many onsite observations need to be compared with the BTV.											

Non-Parametric Confidence Interval

Parameter: Zinc
Well: MW-1
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-1	8/12/2015	7 J	1
MW-1	11/20/2015	ND<10 U	3
MW-1	2/17/2016	ND<10 U	3
MW-1	5/27/2016	ND<10 U	3
MW-1	4/6/2016	10.2	5
MW-1	10/15/2015	12.4	6
MW-1	7/12/2016	13.2	7
MW-1	1/6/2016	13.3	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 13.3
Lower Confidence Inverval X(1) = 7
7 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Zinc
Well: MW-2
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-2	5/27/2016	ND<10 U	1.5
MW-2	1/6/2016	ND<10 U	1.5
MW-2	8/12/2015	13	3
MW-2	10/15/2015	26.8	4
MW-2	2/17/2016	27.2	5
MW-2	7/12/2016	37.9	6
MW-2	11/19/2015	50.7	7
MW-2	4/6/2016	113	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 113
Lower Confidence Inverval X(1) = 10
10 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Zinc
Well: MW-5
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-5	2/16/2016	ND<10 U	2.5
MW-5	11/18/2015	ND<10 U	2.5
MW-5	1/4/2016	ND<10 U	2.5
MW-5	5/25/2016	ND<10 U	2.5
MW-5	8/12/2015	16	5
MW-5	7/11/2016	21.2	6
MW-5	4/5/2016	36.1	7
MW-5	10/15/2015	106	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 106
Lower Confidence Inverval X(1) = 10
10 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Zinc
Well: MW-6
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-6	8/12/2015	6 J	1
MW-6	4/5/2016	ND<10 U	3.5
MW-6	11/20/2015	ND<10 U	3.5
MW-6	2/17/2016	ND<10 U	3.5
MW-6	5/26/2016	ND<10 U	3.5
MW-6	1/5/2016	11.3	6
MW-6	10/19/2015	11.5	7
MW-6	7/11/2016	11.8	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 11.8
Lower Confidence Inverval X(1) = 6
6 > 0 Indicating Statistical Significance

Non-Parametric Confidence Interval

Parameter: Zinc
Well: MW-8
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
99% Comparison Level
Total measurements = 8

Ranks

Point	Date	Value	Rank
MW-8	8/12/2015	5.1 J	1
MW-8	5/26/2016	ND<10 U	2
MW-8	10/15/2015	12	3
MW-8	2/18/2016	14.6	4
MW-8	7/12/2016	17.8	5
MW-8	1/6/2016	18.7	6
MW-8	11/20/2015	22.1	7
MW-8	4/6/2016	47.7	8

M = 8
n + 1 - M = 1
Two Sided Confidence Level = 99.2%

Upper Confidence Interval X(8) = 47.7
Lower Confidence Inverval X(1) = 5.1
5.1 > 0 Indicating Statistical Significance

Sen's Slope Analysis

Parameter: Zinc
Location: MW-1

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
12.4 (10/15/2015)	7 J (8/12/2015)	(12.4 - 7)/(2 - 1)	5.4
ND<10 U (11/20/2015)	7 J (8/12/2015)	(10 - 7)/(3 - 1)	1.5
13.3 (1/6/2016)	7 J (8/12/2015)	(13.3 - 7)/(4 - 1)	2.1
ND<10 U (2/17/2016)	7 J (8/12/2015)	(10 - 7)/(5 - 1)	0.75
10.2 (4/6/2016)	7 J (8/12/2015)	(10.2 - 7)/(6 - 1)	0.64
ND<10 U (5/27/2016)	7 J (8/12/2015)	(10 - 7)/(7 - 1)	0.5
13.2 (7/12/2016)	7 J (8/12/2015)	(13.2 - 7)/(8 - 1)	0.885714
ND<10 U (11/20/2015)	12.4 (10/15/2015)	(10 - 12.4)/(3 - 2)	-2.4
13.3 (1/6/2016)	12.4 (10/15/2015)	(13.3 - 12.4)/(4 - 2)	0.45
ND<10 U (2/17/2016)	12.4 (10/15/2015)	(10 - 12.4)/(5 - 2)	-0.8
10.2 (4/6/2016)	12.4 (10/15/2015)	(10.2 - 12.4)/(6 - 2)	-0.55
ND<10 U (5/27/2016)	12.4 (10/15/2015)	(10 - 12.4)/(7 - 2)	-0.48
13.2 (7/12/2016)	12.4 (10/15/2015)	(13.2 - 12.4)/(8 - 2)	0.133333
13.3 (1/6/2016)	ND<10 U (11/20/2015)	(13.3 - 10)/(4 - 3)	3.3
ND<10 U (2/17/2016)	ND<10 U (11/20/2015)	(10 - 10)/(5 - 3)	0
10.2 (4/6/2016)	ND<10 U (11/20/2015)	(10.2 - 10)/(6 - 3)	0.0666667
ND<10 U (5/27/2016)	ND<10 U (11/20/2015)	(10 - 10)/(7 - 3)	0
13.2 (7/12/2016)	ND<10 U (11/20/2015)	(13.2 - 10)/(8 - 3)	0.64
ND<10 U (2/17/2016)	13.3 (1/6/2016)	(10 - 13.3)/(5 - 4)	-3.3
10.2 (4/6/2016)	13.3 (1/6/2016)	(10.2 - 13.3)/(6 - 4)	-1.55
ND<10 U (5/27/2016)	13.3 (1/6/2016)	(10 - 13.3)/(7 - 4)	-1.1
13.2 (7/12/2016)	13.3 (1/6/2016)	(13.2 - 13.3)/(8 - 4)	-0.025
10.2 (4/6/2016)	ND<10 U (2/17/2016)	(10.2 - 10)/(6 - 5)	0.2
ND<10 U (5/27/2016)	ND<10 U (2/17/2016)	(10 - 10)/(7 - 5)	0
13.2 (7/12/2016)	ND<10 U (2/17/2016)	(13.2 - 10)/(8 - 5)	1.06667
ND<10 U (5/27/2016)	10.2 (4/6/2016)	(10 - 10.2)/(7 - 6)	-0.2
13.2 (7/12/2016)	10.2 (4/6/2016)	(13.2 - 10.2)/(8 - 6)	1.5
13.2 (7/12/2016)	ND<10 U (5/27/2016)	(13.2 - 10)/(8 - 7)	3.2

Number of Q values = 28

Ordered Q Values

n	Q
1	-3.3
2	-2.4
3	-1.55
4	-1.1
5	-0.8
6	-0.55
7	-0.48
8	-0.2
9	-0.025
10	0
11	0
12	0
13	0.0666667
14	0.133333
15	0.2
16	0.45
17	0.5
18	0.64
19	0.64
20	0.75
21	0.885714
22	1.06667

23	1.5
24	1.5
25	2.1
26	3.2
27	3.3
28	5.4

Sen's Estimator (Median Q) is 0.166667

Tied Group	Value	Members
1	10	3

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 61.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 12.9167
M1 = (28 - 12.9167)/2.0 = 7.54164
M2 = (28 + 12.9167)/2.0 + 1 = 21.4584
Lower limit is -0.2 = Q(8)
Upper limit is 0.885714 = Q(21)
-0.2 < 0 < 0.885714 indicating no trend in data.

Sen's Slope Analysis

Parameter: Zinc
Location: MW-2

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
26.8 (10/15/2015)	13 (8/12/2015)	(26.8 - 13)/(2 - 1)	13.8
50.7 (11/19/2015)	13 (8/12/2015)	(50.7 - 13)/(3 - 1)	18.85
ND<10 U (1/6/2016)	13 (8/12/2015)	(10 - 13)/(4 - 1)	-1
27.2 (2/17/2016)	13 (8/12/2015)	(27.2 - 13)/(5 - 1)	3.55
113 (4/6/2016)	13 (8/12/2015)	(113 - 13)/(6 - 1)	20
ND<10 U (5/27/2016)	13 (8/12/2015)	(10 - 13)/(7 - 1)	-0.5
37.9 (7/12/2016)	13 (8/12/2015)	(37.9 - 13)/(8 - 1)	3.55714
50.7 (11/19/2015)	26.8 (10/15/2015)	(50.7 - 26.8)/(3 - 2)	23.9
ND<10 U (1/6/2016)	26.8 (10/15/2015)	(10 - 26.8)/(4 - 2)	-8.4
27.2 (2/17/2016)	26.8 (10/15/2015)	(27.2 - 26.8)/(5 - 2)	0.133333
113 (4/6/2016)	26.8 (10/15/2015)	(113 - 26.8)/(6 - 2)	21.55
ND<10 U (5/27/2016)	26.8 (10/15/2015)	(10 - 26.8)/(7 - 2)	-3.36
37.9 (7/12/2016)	26.8 (10/15/2015)	(37.9 - 26.8)/(8 - 2)	1.85
ND<10 U (1/6/2016)	50.7 (11/19/2015)	(10 - 50.7)/(4 - 3)	-40.7
27.2 (2/17/2016)	50.7 (11/19/2015)	(27.2 - 50.7)/(5 - 3)	-11.75
113 (4/6/2016)	50.7 (11/19/2015)	(113 - 50.7)/(6 - 3)	20.7667
ND<10 U (5/27/2016)	50.7 (11/19/2015)	(10 - 50.7)/(7 - 3)	-10.175
37.9 (7/12/2016)	50.7 (11/19/2015)	(37.9 - 50.7)/(8 - 3)	-2.56
27.2 (2/17/2016)	ND<10 U (1/6/2016)	(27.2 - 10)/(5 - 4)	17.2
113 (4/6/2016)	ND<10 U (1/6/2016)	(113 - 10)/(6 - 4)	51.5
ND<10 U (5/27/2016)	ND<10 U (1/6/2016)	(10 - 10)/(7 - 4)	0
37.9 (7/12/2016)	ND<10 U (1/6/2016)	(37.9 - 10)/(8 - 4)	6.975
113 (4/6/2016)	27.2 (2/17/2016)	(113 - 27.2)/(6 - 5)	85.8
ND<10 U (5/27/2016)	27.2 (2/17/2016)	(10 - 27.2)/(7 - 5)	-8.6
37.9 (7/12/2016)	27.2 (2/17/2016)	(37.9 - 27.2)/(8 - 5)	3.56667
ND<10 U (5/27/2016)	113 (4/6/2016)	(10 - 113)/(7 - 6)	-103
37.9 (7/12/2016)	113 (4/6/2016)	(37.9 - 113)/(8 - 6)	-37.55
37.9 (7/12/2016)	ND<10 U (5/27/2016)	(37.9 - 10)/(8 - 7)	27.9

Number of Q values = 28

Ordered Q Values

n	Q
1	-103
2	-40.7
3	-37.55
4	-11.75
5	-10.175
6	-8.6
7	-8.4
8	-3.36
9	-2.56
10	-1
11	-0.5
12	0
13	0.133333
14	1.85
15	3.55
16	3.55714
17	3.56667
18	6.975
19	13.8
20	17.2
21	18.85
22	20

23	20.7667
24	21.55
25	23.9
26	27.9
27	51.5
28	85.8

Sen's Estimator (Median Q) is 2.7

Tied Group	Value	Members
1	10	2

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/19/2015	1
1/6/2016	1
2/17/2016	1
4/6/2016	1
5/27/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -8.4 = Q(7)
Upper limit is 20 = Q(22)
-8.4 < 0 < 20 indicating no trend in data.

Sen's Slope Analysis

Parameter: Zinc
Location: MW-5

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
106 (10/15/2015)	16 (8/12/2015)	(106 - 16)/(2 - 1)	90
ND<10 U (11/18/2015)	16 (8/12/2015)	(10 - 16)/(3 - 1)	-3
ND<10 U (1/4/2016)	16 (8/12/2015)	(10 - 16)/(4 - 1)	-2
ND<10 U (2/16/2016)	16 (8/12/2015)	(10 - 16)/(5 - 1)	-1.5
36.1 (4/5/2016)	16 (8/12/2015)	(36.1 - 16)/(6 - 1)	4.02
ND<10 U (5/25/2016)	16 (8/12/2015)	(10 - 16)/(7 - 1)	-1
21.2 (7/11/2016)	16 (8/12/2015)	(21.2 - 16)/(8 - 1)	0.742857
ND<10 U (11/18/2015)	106 (10/15/2015)	(10 - 106)/(3 - 2)	-96
ND<10 U (1/4/2016)	106 (10/15/2015)	(10 - 106)/(4 - 2)	-48
ND<10 U (2/16/2016)	106 (10/15/2015)	(10 - 106)/(5 - 2)	-32
36.1 (4/5/2016)	106 (10/15/2015)	(36.1 - 106)/(6 - 2)	-17.475
ND<10 U (5/25/2016)	106 (10/15/2015)	(10 - 106)/(7 - 2)	-19.2
21.2 (7/11/2016)	106 (10/15/2015)	(21.2 - 106)/(8 - 2)	-14.1333
ND<10 U (1/4/2016)	ND<10 U (11/18/2015)	(10 - 10)/(4 - 3)	0
ND<10 U (2/16/2016)	ND<10 U (11/18/2015)	(10 - 10)/(5 - 3)	0
36.1 (4/5/2016)	ND<10 U (11/18/2015)	(36.1 - 10)/(6 - 3)	8.7
ND<10 U (5/25/2016)	ND<10 U (11/18/2015)	(10 - 10)/(7 - 3)	0
21.2 (7/11/2016)	ND<10 U (11/18/2015)	(21.2 - 10)/(8 - 3)	2.24
ND<10 U (2/16/2016)	ND<10 U (1/4/2016)	(10 - 10)/(5 - 4)	0
36.1 (4/5/2016)	ND<10 U (1/4/2016)	(36.1 - 10)/(6 - 4)	13.05
ND<10 U (5/25/2016)	ND<10 U (1/4/2016)	(10 - 10)/(7 - 4)	0
21.2 (7/11/2016)	ND<10 U (1/4/2016)	(21.2 - 10)/(8 - 4)	2.8
36.1 (4/5/2016)	ND<10 U (2/16/2016)	(36.1 - 10)/(6 - 5)	26.1
ND<10 U (5/25/2016)	ND<10 U (2/16/2016)	(10 - 10)/(7 - 5)	0
21.2 (7/11/2016)	ND<10 U (2/16/2016)	(21.2 - 10)/(8 - 5)	3.73333
ND<10 U (5/25/2016)	36.1 (4/5/2016)	(10 - 36.1)/(7 - 6)	-26.1
21.2 (7/11/2016)	36.1 (4/5/2016)	(21.2 - 36.1)/(8 - 6)	-7.45
21.2 (7/11/2016)	ND<10 U (5/25/2016)	(21.2 - 10)/(8 - 7)	11.2

Number of Q values = 28

Ordered Q Values

n	Q
1	-96
2	-48
3	-32
4	-26.1
5	-19.2
6	-17.475
7	-14.1333
8	-7.45
9	-3
10	-2
11	-1.5
12	-1
13	0
14	0
15	0
16	0
17	0
18	0
19	0.742857
20	2.24
21	2.8
22	3.73333

23	4.02
24	8.7
25	11.2
26	13.05
27	26.1
28	90

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	10	4

Time Period	Observations
8/12/2015	1
10/15/2015	1
11/18/2015	1
1/4/2016	1
2/16/2016	1
4/5/2016	1
5/25/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 156
B = 0
C = 24
D = 0
E = 12
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 56.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 12.382
M1 = (28 - 12.382)/2.0 = 7.809
M2 = (28 + 12.382)/2.0 + 1 = 21.191
Lower limit is -7.45 = Q(8)
Upper limit is 2.8 = Q(21)
-7.45 < 0 < 2.8 indicating no trend in data.

Sen's Slope Analysis

Parameter: Zinc
Location: MW-6

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
11.5 (10/19/2015)	6 J (8/12/2015)	(11.5 - 6)/(2 - 1)	5.5
ND<10 U (11/20/2015)	6 J (8/12/2015)	(10 - 6)/(3 - 1)	2
11.3 (1/5/2016)	6 J (8/12/2015)	(11.3 - 6)/(4 - 1)	1.76667
ND<10 U (2/17/2016)	6 J (8/12/2015)	(10 - 6)/(5 - 1)	1
ND<10 U (4/5/2016)	6 J (8/12/2015)	(10 - 6)/(6 - 1)	0.8
ND<10 U (5/26/2016)	6 J (8/12/2015)	(10 - 6)/(7 - 1)	0.666667
11.8 (7/11/2016)	6 J (8/12/2015)	(11.8 - 6)/(8 - 1)	0.828571
ND<10 U (11/20/2015)	11.5 (10/19/2015)	(10 - 11.5)/(3 - 2)	-1.5
11.3 (1/5/2016)	11.5 (10/19/2015)	(11.3 - 11.5)/(4 - 2)	-0.1
ND<10 U (2/17/2016)	11.5 (10/19/2015)	(10 - 11.5)/(5 - 2)	-0.5
ND<10 U (4/5/2016)	11.5 (10/19/2015)	(10 - 11.5)/(6 - 2)	-0.375
ND<10 U (5/26/2016)	11.5 (10/19/2015)	(10 - 11.5)/(7 - 2)	-0.3
11.8 (7/11/2016)	11.5 (10/19/2015)	(11.8 - 11.5)/(8 - 2)	0.05
11.3 (1/5/2016)	ND<10 U (11/20/2015)	(11.3 - 10)/(4 - 3)	1.3
ND<10 U (2/17/2016)	ND<10 U (11/20/2015)	(10 - 10)/(5 - 3)	0
ND<10 U (4/5/2016)	ND<10 U (11/20/2015)	(10 - 10)/(6 - 3)	0
ND<10 U (5/26/2016)	ND<10 U (11/20/2015)	(10 - 10)/(7 - 3)	0
11.8 (7/11/2016)	ND<10 U (11/20/2015)	(11.8 - 10)/(8 - 3)	0.36
ND<10 U (2/17/2016)	11.3 (1/5/2016)	(10 - 11.3)/(5 - 4)	-1.3
ND<10 U (4/5/2016)	11.3 (1/5/2016)	(10 - 11.3)/(6 - 4)	-0.65
ND<10 U (5/26/2016)	11.3 (1/5/2016)	(10 - 11.3)/(7 - 4)	-0.433333
11.8 (7/11/2016)	11.3 (1/5/2016)	(11.8 - 11.3)/(8 - 4)	0.125
ND<10 U (4/5/2016)	ND<10 U (2/17/2016)	(10 - 10)/(6 - 5)	0
ND<10 U (5/26/2016)	ND<10 U (2/17/2016)	(10 - 10)/(7 - 5)	0
11.8 (7/11/2016)	ND<10 U (2/17/2016)	(11.8 - 10)/(8 - 5)	0.6
ND<10 U (5/26/2016)	ND<10 U (4/5/2016)	(10 - 10)/(7 - 6)	0
11.8 (7/11/2016)	ND<10 U (4/5/2016)	(11.8 - 10)/(8 - 6)	0.9
11.8 (7/11/2016)	ND<10 U (5/26/2016)	(11.8 - 10)/(8 - 7)	1.8

Number of Q values = 28

Ordered Q Values

n	Q
1	-1.5
2	-1.3
3	-0.65
4	-0.5
5	-0.433333
6	-0.375
7	-0.3
8	-0.1
9	0
10	0
11	0
12	0
13	0
14	0
15	0.05
16	0.125
17	0.36
18	0.6
19	0.666667
20	0.8
21	0.828571
22	0.9

23	1
24	1.3
25	1.76667
26	1.8
27	2
28	5.5

Sen's Estimator (Median Q) is 0.025

Tied Group	Value	Members
1	10	4

Time Period	Observations
8/12/2015	1
10/19/2015	1
11/20/2015	1
1/5/2016	1
2/17/2016	1
4/5/2016	1
5/26/2016	1
7/11/2016	1

There are 0 time periods with multiple data

A = 156
B = 0
C = 24
D = 0
E = 12
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 56.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 12.382
M1 = (28 - 12.382)/2.0 = 7.809
M2 = (28 + 12.382)/2.0 + 1 = 21.191
Lower limit is -0.1 = Q(8)
Upper limit is 0.828571 = Q(21)
-0.1 < 0 < 0.828571 indicating no trend in data.

Sen's Slope Analysis

Parameter: Zinc
Location: MW-8

Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
12 (10/15/2015)	5.1 J (8/12/2015)	(12 - 5.1)/(2 - 1)	6.9
22.1 (11/20/2015)	5.1 J (8/12/2015)	(22.1 - 5.1)/(3 - 1)	8.5
18.7 (1/6/2016)	5.1 J (8/12/2015)	(18.7 - 5.1)/(4 - 1)	4.53333
14.6 (2/18/2016)	5.1 J (8/12/2015)	(14.6 - 5.1)/(5 - 1)	2.375
47.7 (4/6/2016)	5.1 J (8/12/2015)	(47.7 - 5.1)/(6 - 1)	8.52
ND<10 U (5/26/2016)	5.1 J (8/12/2015)	(10 - 5.1)/(7 - 1)	0.816667
17.8 (7/12/2016)	5.1 J (8/12/2015)	(17.8 - 5.1)/(8 - 1)	1.81429
22.1 (11/20/2015)	12 (10/15/2015)	(22.1 - 12)/(3 - 2)	10.1
18.7 (1/6/2016)	12 (10/15/2015)	(18.7 - 12)/(4 - 2)	3.35
14.6 (2/18/2016)	12 (10/15/2015)	(14.6 - 12)/(5 - 2)	0.866667
47.7 (4/6/2016)	12 (10/15/2015)	(47.7 - 12)/(6 - 2)	8.925
ND<10 U (5/26/2016)	12 (10/15/2015)	(10 - 12)/(7 - 2)	-0.4
17.8 (7/12/2016)	12 (10/15/2015)	(17.8 - 12)/(8 - 2)	0.966667
18.7 (1/6/2016)	22.1 (11/20/2015)	(18.7 - 22.1)/(4 - 3)	-3.4
14.6 (2/18/2016)	22.1 (11/20/2015)	(14.6 - 22.1)/(5 - 3)	-3.75
47.7 (4/6/2016)	22.1 (11/20/2015)	(47.7 - 22.1)/(6 - 3)	8.53333
ND<10 U (5/26/2016)	22.1 (11/20/2015)	(10 - 22.1)/(7 - 3)	-3.025
17.8 (7/12/2016)	22.1 (11/20/2015)	(17.8 - 22.1)/(8 - 3)	-0.86
14.6 (2/18/2016)	18.7 (1/6/2016)	(14.6 - 18.7)/(5 - 4)	-4.1
47.7 (4/6/2016)	18.7 (1/6/2016)	(47.7 - 18.7)/(6 - 4)	14.5
ND<10 U (5/26/2016)	18.7 (1/6/2016)	(10 - 18.7)/(7 - 4)	-2.9
17.8 (7/12/2016)	18.7 (1/6/2016)	(17.8 - 18.7)/(8 - 4)	-0.225
47.7 (4/6/2016)	14.6 (2/18/2016)	(47.7 - 14.6)/(6 - 5)	33.1
ND<10 U (5/26/2016)	14.6 (2/18/2016)	(10 - 14.6)/(7 - 5)	-2.3
17.8 (7/12/2016)	14.6 (2/18/2016)	(17.8 - 14.6)/(8 - 5)	1.06667
ND<10 U (5/26/2016)	47.7 (4/6/2016)	(10 - 47.7)/(7 - 6)	-37.7
17.8 (7/12/2016)	47.7 (4/6/2016)	(17.8 - 47.7)/(8 - 6)	-14.95
17.8 (7/12/2016)	ND<10 U (5/26/2016)	(17.8 - 10)/(8 - 7)	7.8

Number of Q values = 28

Ordered Q Values

n	Q
1	-37.7
2	-14.95
3	-4.1
4	-3.75
5	-3.4
6	-3.025
7	-2.9
8	-2.3
9	-0.86
10	-0.4
11	-0.225
12	0.816667
13	0.866667
14	0.966667
15	1.06667
16	1.81429
17	2.375
18	3.35
19	4.53333
20	6.9
21	7.8
22	8.5

23	8.52
24	8.53333
25	8.925
26	10.1
27	14.5
28	33.1

Sen's Estimator (Median Q) is 1.01667

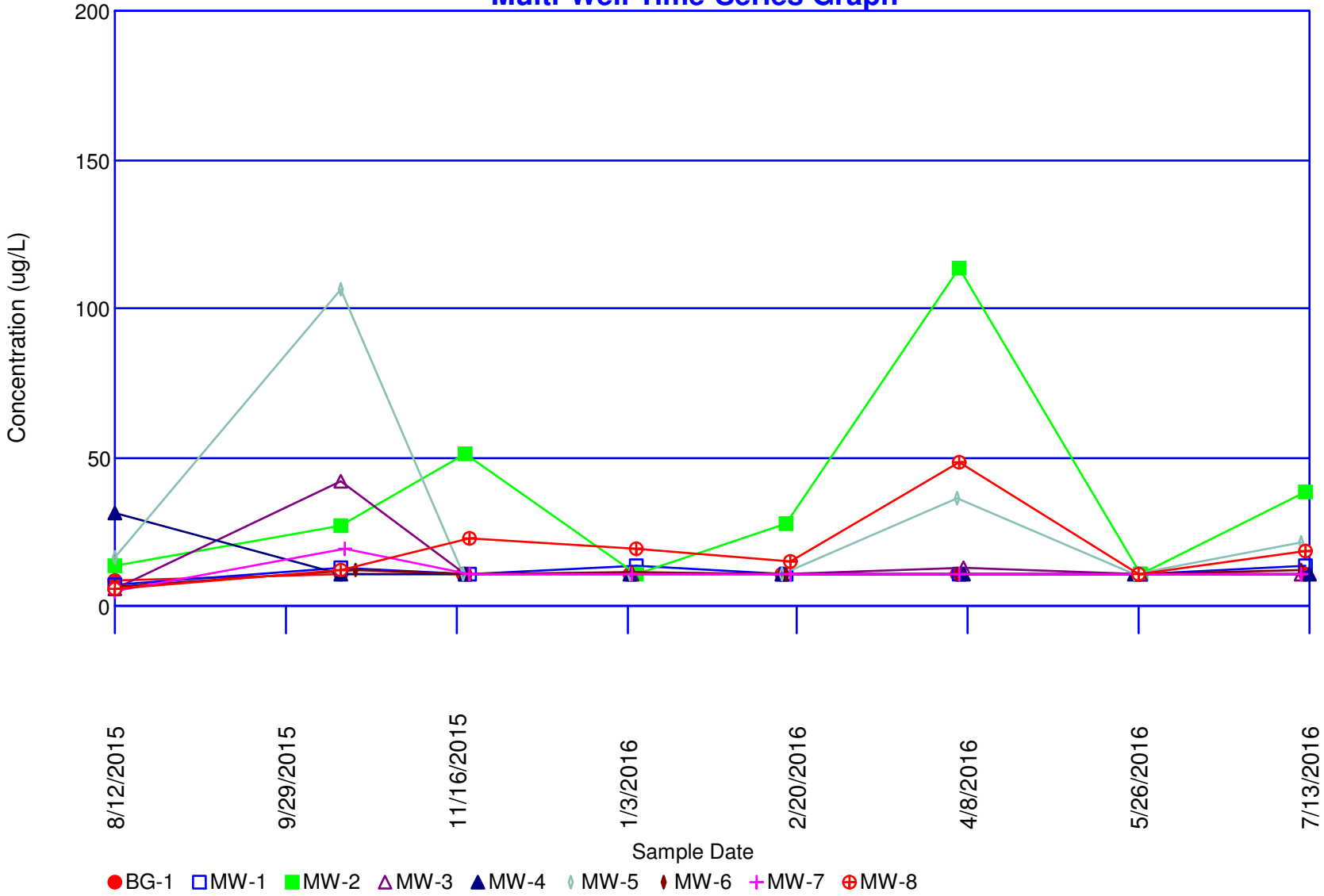
Time Period	Observations
8/12/2015	1
10/15/2015	1
11/20/2015	1
1/6/2016	1
2/18/2016	1
4/6/2016	1
5/26/2016	1
7/12/2016	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -2.9 = Q(7)
Upper limit is 8.5 = Q(22)
-2.9 < 0 < 8.5 indicating no trend in data.

Zinc

Multi-Well Time-Series Graph



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