2018 Annual Groundwater Summary

Brickhaven No. 2 Mine Tract “A” Structural Fill

Charah Inc.

Moncure, Chatham County, North Carolina

Click here to enter a date.

”

HDR Engineering, Inc. of the Carolinas
440 S Church Street, Suite 1000, Charlotte, NC 28202-2075
704.338.6700
NC License F0116

2018 Annual Groundwater Summary

Brickhaven No.2 Mine Tract "A" Structural Fill Permit 19-10

The Brickhaven No.2 Mine Tract "A" Structural Fill groundwater monitoring system is designed to meet the requirements of the North Carolina Coal Ash Management Act of 2014 (CAMA) and North Carolina Department of Environmental Quality Rule 15A NCAC 13B Section .1631.

HDR conducted the required 2018 semi-annual sampling events on January 22-25 and July 16-19, 2018. Groundwater monitoring and sampling at the site is governed by the following:

- North Carolina - Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729)
- Water Quality Monitoring Plan Brickhaven No.2 Mine Tract "A" Structural Fill, approved March 2015
- North Carolina Department of Environmental Quality (NCDEQ) 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
- EPA 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance and CFR 40 257.93 (f)(3)

The spring and fall summary reports with an EPA method of statistical analysis were submitted to the NCDEQ Division of Waste Management on April 25 and December 28, 2018 respectively. The reports are attached for reference and can be found on the NCDEQ website at this location https://deq.nc.gov/about/divisions/waste-management/laserfiche. The following information has been provided in those reports:

- Status of the groundwater monitoring for the structural fill
- A summary of site conditions and key actions completed during the routine reporting period
- Description of conditions encountered and actions employed to define the conditions
- Key activities proposed for the upcoming year
- A map showing the background (or upgradient) and downgradient monitoring wells
- Monitoring data obtained from sampling of wells, including information on the samples collected

The findings of the groundwater sampling and laboratory testing conducted in 2018 indicate the presence of naturally occurring constituents that were detected at various levels both prior to

and after placement of coal combustion products. HDR conducted an alternate source demonstration (ASD) in 2018 to evaluate whether the presence and concentration of these constituents were attributable to naturally occurring conditions or a release from the lined structural fill unit. Through a multiple-lines-of-evidence approach, HDR demonstrated that statistically significant increases (SSIs) identified in the January 2018 data set are not the result of a release from the new, lined structural fill unit. Thus, Charah has continued detection monitoring at the site through 2018. A copy of the ASD is being provided to NCDEQ under separate cover. In addition, HDR installed a second background well (BG-2) in December 2018 to supplement the existing background groundwater quality dataset and assist in the evaluation of variability of water quality across the site. As additional background groundwater samples are collected, the background statistics will be updated.

As HDR's authorized representative, I have prepared or supervised the preparation of the referenced documents above; which have been prepared in general accordance with industry standards and practices; and the information contained therein is truthful and accurate to the best of my knowledge.



Michael Plummer, PE
Sr. Project Manager

HDR Engineering, Inc. of the Carolinas
440 South Church St, Suite 1000
Charlotte, NC 28202-2075
704.338.6700
NC License F0116

A

Attachment A – 2018 First Semi-Annual Detection Monitoring Report

2018 First Semi-Annual Detection Monitoring Report

Brickhaven No.2 Mine Tract "A" Structural Fill

Charah, LLC

Moncure, Chatham County, North Carolina
April 25, 2018

HDR Engineering, Inc. of the Carolinas
440 S Church Street, Suite 1000, Charlotte, NC 28202-2075
704.338.6700
NC License F0116

This page intentionally left blank.

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 Meadow - Charah, LLC

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

Name: Michael Plummer, PE Phone: 704 - 338 - 6700

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, LLC Brickhaven No. 2 Mine Tract 'A'	1271 Moncure - Flatwood Rd Chatham County Moncure, North Carolina	1910-STRUC-2015	CAMA	January 22-25, 2018

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, PE — Facility Representative Name (Print)

Project Manager — Title

704 - 338 - 6700 — (Area Code) Telephone Number

Signature

04/25/2018 — Date

Affix NC Licensed/ Professional Geologist Seal



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

Table of Contents

1 Introduction 1
1.1 Purpose 1
1.2 Regulatory Compliance 1
1.3 Site Location and Operation 1
1.4 Groundwater Monitoring System 2
1.5 Site Topography and Geographical Setting 4
1.6 Geologic and Hydrogeologic Setting 4
1.6.1 Regional Geology 4
1.6.2 Site Geology 5
1.6.3 Regional Hydrogeology 6
1.7 Groundwater Flow Characteristics 6
1.7.1 Groundwater Direction 6
1.7.2 Hydraulic Conductivity 9
1.7.3 Horizontal Hydraulic Gradients 9
1.7.4 Groundwater Flow Velocity 9
2 Sampling Procedures 11
2.1 Groundwater Sampling Procedures 11
2.2 Surface Water Sampling Procedures 12
2.3 Leachate Sampling Procedures 12
3 Background Conditions and Results 13
3.1 Background Site Conditions 13
3.2 2018 First Semi-Annual Detection Monitoring Groundwater Analytical Results 14
3.3 Surface Water Analytical Results 17
3.4 Leachate Analytical Results 17
4 Statistics 18
4.1 Methodology 18
4.1.1 Statistical Analysis 18
4.1.2 Outliers 18
4.1.3 Data Distribution 19
4.1.4 Trends 19
4.2 Evaluation for SSIs over Background 20
4.3 Statistical Summary 22
5 Conclusion 23
5.1 Groundwater 23
5.2 Surface Water 23
5.3 Leachate 23
5.4 Statistical Analysis 23
5.5 Overall Summary 24
6 Recommendations 25
7 References 26

List of Tables

Table 1: Well Construction, Survey, and Groundwater Elevations 3
Table 2: Historic Groundwater Elevations 7
Table 3: Hydraulic Conductivity 8
Table 4: Horizontal Hydraulic Gradients (i, dh/dl) 9
Table 5: Groundwater Flow Velocity between Well Pairs (Vs, ft/year) 10
Table 6: Analyte Detections and Exceedances - January 2018 15
Table 7: Summary of Evaluations for SSIs over Background for January 2018 20

Figures

Figure 1: Regional Site Location Map
Figure 2: Potentiometric Surface Map – January 2018
Figure 3: Surface Water Sample Location Map
Figure 4: Leachate Sample Collection Location

Appendices

Appendix A – Field Data Sheets
Appendix B – Laboratory Reports, Chains of Custody, & Quality Control Data
Appendix C – Electronic Data Deliverables (CD-ROM only)
Appendix D – Statistical Analysis Memo

List of Select Acronyms

µg/L	micrograms per liter
bMDL	below Method Detection Limit
CAMA	North Carolina Coal Ash Management Act of 2014
CCR	Coal Combustion Residuals
DEC	Duke Energy Carolinas
DEP	Duke Energy Progress
DO	Dissolved Oxygen
EDD	Electronic Data Deliverable
EPA	United States Environmental Protection Agency
ft./ft.	feet / foot
ID	Inner Diameter
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCGPS	North Carolina groundwater protection standard
N	Standard Penetration Resistance
ND	Non-detects
NPPL	Non-parametric Prediction Limit
NTU	Nephelometric turbidity units
MCL	Maximum Contaminant Levels
MDL	Method Detection Limit
msl	mean sea level
OD	Outer Diameter
ORP	Oxidation-Reduction Potential
PL	Predictive Limit
PPL	Parametric Prediction Limit
RCRA	Resource Conservation and Recovery Act
ROS	Regression on Order Statistics
SSI	Statistically Significant Increase
UPL	Upper Prediction Limit
USCS	United Soil Classification System

This page intentionally left blank.

1 Introduction

1.1 Purpose

This *2018 First Semi-Annual Detection Monitoring Report* addresses the semi-annual detection monitoring at the Brickhaven No.2 Mine Tract "A" Structural Fill site in Moncure, Chatham County, North Carolina. The report includes results from the January 22-25, 2018 semi-annual detection monitoring event, as well as the statistical results calculated for this monitoring event.

The next semi-annual monitoring event will take place in July 2018.

1.2 Regulatory Compliance

Groundwater monitoring and sampling at the site is governed by the following:

- North Carolina - Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729).
- Water Quality Monitoring Plan, Brickhaven No.2 Mine Tract "A" Structural Fill, approved March 2015 (Buxton, 2015a).
- North Carolina Department of Environment and Natural Resources (NCDENR)[1] Permit No. 1910-STRUC-2015, issued June 5, 2015.
- NCDENR Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling, April 2008 including Groundwater Rules .1600.
- NCDENR 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.

Groundwater monitoring and sampling at the site is also conducted in general accordance U.S. EPA CCR Rule.

1.3 Site Location and Operation

The site is located in Chatham County, approximately four miles southeast of Moncure, North Carolina (**Figure 1**). The owner of the site is Green Meadow, LLC (Green Meadow). Charah, LLC (Charah) is responsible for the operation and maintenance of the site. The mine property is approximately 301 acres in total; the structural fill area permitted for placement of coal combustion residuals (CCR) will comprise of approximately 145 acres when construction is complete.

The property located within the structural fill area was previously owned by General Shale Brick, Inc., which operated the site and an adjacent property as a clay mine beginning in 1985 for their

[1] On September 18, 2015, the North Carolina Department of Environment and Natural Resources (NCDENR) became the North Carolina Department of Environmental Quality (NCDEQ). Both naming conventions are used in this report, as appropriate.

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 (October 2015), municipal water is available to the surrounding area.

Charah began CCR placement in the first composite liner containment system (Cell 1, Sub Cell 1A) on October 23, 2015. CCR placement has occurred in Cell 1, Cell 2, and continues construction on Cell 6A and Cell 6B at of the time of this sampling event. Charah has placed just over 6 million tons of CCR material in the structural fill at the time of this report. Charah plans to place approximately 12,000,000 tons of CCR in the structural fill. The placement phase is anticipated to continue for eight years, although it could vary depending on the importation rate. CCR materials (including fly ash, bottom ash, boiler slag, and/or flue gas desulfurization materials) were initially brought to the site by truck and are now delivered exclusively by rail. The CCR originated at the Duke Energy Carolinas (DEC) Riverbend Steam Station and Duke Energy Progress (DEP) L.V. Sutton Energy Complex (Sutton Plant) sites. CCR could eventually be brought to the site from other DEC and/or DEP sites in North Carolina.

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 the collection, storage, and disposal of the resultant liquid. Green Meadow has approved pump and haul permits to dispose of leachate at the City of Sanford's Big Buffalo Creek Wastewater Treatment Plant and South Harnett Regional Wastewater Treatment Plant in Spring Lake, North Carolina.

1.4 Groundwater Monitoring System

The site's groundwater monitoring system was designed to provide background groundwater quality data prior to the placement of CCR in the structural fill and early detection of potential CCR constituents subsequent to CCR placement to be protective of human health and the environment. The groundwater monitoring system is comprised of nine (9) wells; eight (8) downgradient/side-gradient compliance monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7R, and MW-8) and a background well (BG-1). **Table 1** depicts Well Construction Details.

Background monitoring well (BG-1) was installed in July of 2015 near the entrance of the site along Moncure-Flatwood Road. This background well location was installed to improve the determination of appropriate levels of constituents existing at the site independent of the site's use as a structural fill.

MW-7R was installed in April of 2017 as a replacement for monitoring well MW-7 as documented and approved in the May 25, 2017 memorandum to NCDEQ - Solid Waste Section. MW-7 will temporarily remain onsite for water level gauging purposes only.

Table 1: Well Construction, Survey, and Groundwater Elevations

Well ID	Northing	Easting	Pad Elev. (msl)	TOC Elev. (msl)	TD BGS (ft.)	TD BTOC (ft.)	Screen Length (ft.)	Screen Interval (msl)	DTW BTOC (ft.)	DTW Elevation (msl)	Lithologic Unit
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	200.14 - 185.14	16.23	211.96	Layered Rock/PWR*
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	220.20 - 205.20	62.47	217.61	Layered Rock/PWR*
MW-2	673677.07	1994537.54	229.27	231.76	47.66	50.15	15	196.61 - 181.61	45.43	186.33	Layered Rock/PWR*
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	194.20 - 179.20	23.03	199.53	PWR
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	201.79 - 191.79	14.97	202.16	Residuum/PWR
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	208.72 - 198.72	26.00	218.86	PWR
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	216.63 - 201.63	8.96	222.14	Residuum/PWR
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	224.53 - 214.53	16.68	215.03	Residuum/PWR
MW-7R	672221.96	1992702.98	239.99	242.22	36.00	39.94	10	213.99 - 203.99	24.68	217.54	Residuum/PWR
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	202.41 - 187.41	37.72	198.75	PWR

Notes:
1. Top-of-casing, 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, ground surface elevations and horizontal locations at BG-1, MW-1, MW-3, MW-6, MW-8 and MW-7R determined by McAdams of Durham, NC.
3. Top-of-casing, ground surface and horizontal location at monitoring well MW-2 determined by Gregory C. Bewley.
4. 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.
5. Depth to water measurements obtained on January 22, 2018, to the nearest 0.01 foot with a water level meter by Pace Analytical Services, LLC.
6. Based on NAD 83 NGVD88.
* = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation.

1.5 Site Topography and Geographical Setting

According to the 1993 USGS topographic quadrangle and the use of GIS mapping (**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 in elevation from approximately 260 to 270 feet above mean sea level (msl), towards an 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 in elevation from approximately 260 to 270 feet msl, towards on-site intermittent tributary creeks that drain to the southern property boundary at approximately 205 feet msl.

1.6 Geologic and Hydrogeologic Setting

1.6.1 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 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 faults 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 range 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).

1.6.2 Site Geology

The geology of the site area 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 MW-4. The flood plain sediments were only identified at MW-4 on the southeast corner of the site. The summary of the site geologic units is based on boring logs from the *Design Hydrogeologic Report* (Buxton, March 2016) and is summarized below.

FILL

The fill materials were primarily identified in the road bed and berm located around the east and west sides near MW-4 and generally consisted of mottled reddish yellow, orange, brown, and light gray sandy silty clay with quartz and brick gravel.

FLOOD PLAIN

Flood plain sediments were only located adjacent to MW-4 on the southeast corner of the site. The sediments were associated with the former adjacent intermittent tributary creek and sediments can be generally characterized by a mottled light gray; fine sandy silty clay. The flood plain sediments were only approximately 5 feet thick in this area and had been deposited above residuum. Based on geotechnical laboratory data, the flood plain sediments consisted of United Soil Classification System (USCS) group symbol CL.

SOIL HORIZON

The soil horizon can generally be characterized by mottled yellowish, brown, orange, and red color consisting of silty clay and clayey silt. Root structures were common. The soil horizon at the site is formed from the continued weathering and biologic reworking of residuum, and ranges from 2 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 a hydraulic conductivity value of 2.86×10^{-7} cm/sec.

RESIDUUM

The residuum 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 is characteristically fissile, often breaking 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 5 to 15 feet in thickness. The residuum has a Standard Penetration Resistance (N) of less than 100 blows per foot. Based on geotechnical laboratory data, the residuum consisted of USCS group symbol CL and hydraulic conductivity values ranged from 7.69×10^{-8} cm/sec to 3.69×10^{-9} cm/sec.

PARTIALLY WEATHERED ROCK

The partially weathered rock can generally be characterized as 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 are often fissile. The partially weathered rock generally retains the remnant texture, structure, and mineral content of the rock from which it was formed, and ranges from 5 to 40 feet in thickness. Partially weathered rock has a Standard Penetration Resistance (N) 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. Hydraulic conductivity values ranged from 2.433 x 10^{-4} cm/sec to 7.154 x 10^{-8} cm/sec, according to slug or recovery test data (for wells screened solely in partially weathered rock).

LAYERED ROCK

Based on rock coring activities conducted near MW-7/MW-7R and visual inspection of the layered rock exposed on the north side of the MW-4 area, 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 occurs as 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 contained horizontal to near vertical fracturing. Large fractures, oriented approximately N 40° to 60° E at 70° northwest, were observed in weathered mudstone to the immediate northeast near MW-8. Rock Quality Designation (RQD) values for the MW-8 area rock core (21-inch recovery) were poor (47.6%). The occurrence of layered rock at the site was generally defined by auger refusal.

1.6.3 Regional Hydrogeology

The occurrence and movement of groundwater in the Piedmont physiographic province are 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 rock grains. 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 are 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.

1.7 Groundwater Flow Characteristics

Prior to this sampling event, a synoptic groundwater gauging round occurred to establish depth-to-water below top of casing for all nine of the monitoring wells sampled as well as MW-7. Depths-to-water ranged from 8.96 feet below top of casing (MW-6) to 62.47 feet below top of casing (MW-1). Corresponding groundwater elevations ranged from 198.75 above msl (MW-8) to 222.14 above msl (MW-6). Groundwater elevations were measured on January 22, 2018, are shown in **Table 1**. Historic groundwater elevations over time are depicted in **Table 2.**

1.7.1 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 2**. Groundwater elevations and general flow directions remain consistent with prior background and detection monitoring events. Surface water features can be seen in **Figure 3**.

Table 2: Historic Groundwater Elevations

Well ID	TOC Elev. (msl)	Groundwater Elevation (msl)											
		Aug-15	***Oct-15***	***Nov-15***	***Jan-16***	***Feb-16***	***Apr-16***	***Jun-16***	***Jul-16***	***Jan-17***	***Apr-17***	***Jul-17***	***Jan-18***
BG-1	228.19	216.31	215.70	216.83	218.14	218.94	218.46	218.46	218.74	217.08	216.61	216.76	211.96
MW-1	280.08	220.04	220.18	220.55	222.03	222.76	221.83	221.83	221.51	220.58	219.72	219.19	217.61
MW-2	229.97	191.78	190.20	192.90	197.19	198.82	201.17	201.17	204.62	205.42	201.63	201.58	186.33
MW-3	222.56	207.62	208.46	210.29	210.64	212.31	212.36	212.36	204.81	202.35	202.36	203.91	199.53
MW-4	217.13	205.53	206.37	206.83	206.98	211.36	208.34	208.34	205.66	203.67	203.30	204.10	202.16
MW-5	244.86	232.01	229.66	230.11	230.16	228.69	220.06	220.06	222.96	203.32	221.53	222.60	218.86
MW-6	231.10	223.31	223.99	223.97	224.53	224.75	224.13	224.13	224.07	224.54	223.31	223.58	222.14
MW-7	231.71	223.45	222.36	222.53	216.11	215.31	215.66	215.65	216.21	215.42	215.59	216.09	215.03
MW-7R	242.22	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	220.92	217.54
MW-8	236.47	199.98	200.58	201.35	200.60	200.55	199.49	199.49	199.82	199.31	199.11	198.98	198.75

Notes:
1. NG – Not Gauged (MW-7R newly installed April 2017)

Table 3: Hydraulic Conductivity

Well ID	DTW BTOC (ft.)	Length of Water Column (ft.)	Screen Length (ft.)	Screen Interval (msl)	Estimated Effective Porosity	Hydraulic Conductivity (k, cm/sec)	Lithologic Unit
BG-1	16.23	26.82	15	200.14 - 185.14	0.075	7.76E-05	Layered Rock/PWR*
MW-1	62.47	12.83	15	220.20 - 205.20	0.075	4.11E-04	Layered Rock/PWR*
MW-2	45.43	4.72	15	196.61 - 181.61	0.05	3.41E-06	Layered Rock/PWR*
MW-3	23.03	20.33	15	194.20 - 179.20	0.05	4.08E-07	PWR
MW-4	14.97	10.37	10	201.79 - 191.79	0.14	1.41E-04	Residuum/PWR
MW-5	26.00	20.14	10	208.72 - 198.72	0.075	8.01E-06	PWR
MW-6	8.96	20.51	15	216.63 - 201.63	0.15	1.10E-04	Residuum/PWR
MW-7	16.68	0.50	10	224.53 - 214.53	0.15	1.26E-06	Residuum/PWR
MW-8	37.72	11.34	15	202.41 - 187.41	0.075	1.29E-04	PWR

Notes:
1. Depth to water measurements obtained during the Hydrogeologic Report were measured to the nearest 0.01 foot with a water level 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).
4. Effective porosity values from geotechnical testing and the literature (McWhorter and Sunada, 1977; Sinhal and Gupta, 2010) where geotechnical data was not available.
5. MW-7R was installed after the Hydrogeologic Report was submitted and MW-7 was utilized for evaluation.
* = interpreted lithologic unit based on relative drilling hardness during well installation

Table 4: Horizontal Hydraulic Gradients (i, dh/dl)

	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
BG-1	-	0.001				0.003	0.003	0.001	
MW-1		-				0.0003	0.001		
MW-2	0.008	0.020	-	0.011	0.007	0.012	0.012	0.012	0.005
MW-3	0.006	0.007		-	0.002	0.011	0.009	0.007	
MW-4	0.007	0.004			-	0.014	0.009	0.005	
MW-5						-	0.003		
MW-6							-		
MW-7		0.001				0.002	0.007	-	
MW-8	0.003	0.010		0.0003	0.001	0.007	0.011	0.015	-

Notes:
1. Positive horizontal hydraulic gradients calculated by dividing the difference in hydraulic head between a well pair by the length 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-3, MW-6, MW-8 and MW-7R determined by McAdams of Durham, NC.
6. Top-of-casing, ground surface and horizontal location at mon3itoring well MW-2 determined by Gregory C. Bewley.
7. Static water level elevations from January 22, 2018 monitoring event. See **Table 1**.
8. MW-7R was installed after the Hydrogeologic Report was submitted and MW-7 was utilized for evaluation.

1.7.2 Hydraulic Conductivity

Horizontal hydraulic conductivity of aquifer materials adjacent to the well screen were estimated through in-situ slug testing during the *Design Hydrogeologic Report* (Buxton, 2016). Results are provided in **Table 3**.

1.7.3 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. Hydraulic gradients at the site during this sampling event are depicted in **Table 4.**

1.7.4 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 and horizontal hydraulic conductivity values referenced above and estimated effective porosity values from geotechnical testing and from the literature where geotechnical data was not available. (Buxton, 2014; Sinhal and Gupta, 2010).

Seepage velocity varies on a well-by-well basis. Throughout the study area, seepage velocity ranged from nearly 0.03 feet per year (between MW-3 and MW-8) to approximately 31.8 feet per year (between MW-1 and MW-8). The site average seepage velocity is approximately 3.3 feet per year for the evaluated screen intervals and are summarized in **Table 5.** These estimates were calculated with the most recent groundwater level measurements (January 22, 2018).

Table 5: Groundwater Flow Velocity between Well Pairs (Vs, ft/year)

	BG-1	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
BG-1	-	2.9				0.9	2.4	0.1	
MW-1		-				0.3	2.4		
MW-2	2.1	12.5	-	0.3	1.6	1.0	2.4	0.3	1.8
MW-3	0.5	1.4		-	0.2	0.33	0.7	0.05	
MW-4	6.9	9.6			-	4.4	8.1	0.5	
MW-5						-	0.9		
MW-6							-		
MW-7		0.2				0.1	0.5	-	
MW-8	3.8	31.8		0.03	1.3	3.3	12.0	1.8	-

Notes:
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.
3. MW-7R was installed after the Hydrogeologic Report was submitted and MW-7 was utilized for evaluation as it still exists for groundwater gauging only.

2 Sampling Procedures

2.1 Groundwater Sampling Procedures

Groundwater samples from all nine groundwater monitoring wells were collected between January 22-25, 2018 (**Figure 2**). All sampling events have been conducted in compliance of the site's Water Quality Monitoring Plan. This monitoring event was conducted by Pace Analytical Services, LLC. (Pace) of Huntersville, North Carolina (NC Certification #37706). Field data sheets are provided in **Appendix A**.

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 or similar well pump, 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 approximately two feet above the bottom of the well 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) 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 or similar water quality meter; turbidity was recorded with a Micro-TPW meter or similar turbidity meter.

Purging was conducted until a minimum of three well volumes of water had been removed and the field parameters had stabilized in accordance with the targets specified below. If field parameters have stabilized prior to purging three well volumes, or the well has going dry, groundwater samples were then collected. All measurements, except turbidity, were obtained using a flow-through-cell; turbidity measurements were 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)

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, LLC. Sample handling and custody were performed according to the EPA Guidance for Field Samplers.

2.2 Surface Water Sampling Procedures

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 or similar water quality meter; turbidity was recorded with a Micro-TPW meter or similar turbidity meter.

Surface water samples were attempted from two locations outside of the structural fill boundary to inform evaluation of potential groundwater to surface water interactions and evaluation of potential off-site impacts. Surface water sample SW-1 was collected approximately 3,000 feet south of the structural fill boundary along an unnamed tributary of Gulf Creek. Surface water sample SW-2 was collected approximately 3,100 feet west of the structural fill boundary along Shaddox Creek. Approximate surface water sampling locations are depicted on **Figure 3**.

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).

2.3 Leachate Sampling Procedures

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 or similar water quality meter; turbidity was recorded with a Micro-TPW meter or similar turbidity meter.

One leachate sample was collected from on-site storage holding tanks. This leachate sample is used to provide an evaluation of potential on-site leachate impacts. The approximate leachate sampling location is depicted on **Figure 4**.

3 Background Conditions and Results

Groundwater analytical results for the constituents listed in NCDEQ Solid Waste Appendix I and II, 40 CFR 257 Appendix III detection monitoring, and 40 CFR 257 Appendix IV assessment monitoring 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, Charah must notify NCDEQ within 14 days. In the event no new potential impacts are observed, Charah must submit a report of the sampling results to NCDEQ with 120 days per the approved Water Quality of the sampling event.

Assessment monitoring typically occurs if a statistically significant increase in a detection monitoring constituent is noted and will be further assessed in subsequent reporting. Per the NCDEQ approved Water Quality Monitoring Plan, 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).

A summary of the laboratory parameters detected during the 2018 First Semi-Annual Detection Monitoring event, along with the highest detected concentration result, is provided in the sections below. Field data sheets are provided in **Appendix A**. Full laboratory report for the monitoring event is provided in **Appendix B** and electronic data deliverables (EDDs) in **Appendix C**.

3.1 Background Site Conditions

Two groundwater sampling events were conducted prior to CCR material placement (August and October 2015) at the Charah facility. During these events, chloride and TDS were detected at elevated levels in groundwater samples collected from background monitoring well BG-1. Additionally, antimony, arsenic, barium, chromium, cobalt, lithium, pH, sulfate, and vanadium were detected at elevated levels similar to or in exceedance of their respective North Carolina 2L Groundwater Protection Standards (2L Standard). Detections of copper and cobalt exceeded their respective NC Surface Water & Wetland Standards in surface water samples collected as part of the sampling events conducted prior to CCR material placement. Additionally, all EPA Appendix III constituents were detected in the surface water samples collected prior to CCR material placement.

During the first monitoring event, trihalomethanes, bromodichloromethane and dibromochloromethane were detected at concentrations above their respective 2L Standards in groundwater samples collected from MW-2, MW-3, and MW-7. VOCs, including trihalomethanes, are not present naturally at the site. These detections are attributed to the use of municipal water during previous well development activities. These trihalomethanes were only detected in the first sampling event (Round 1 – August 2015). VOCs were not detected above laboratory method detection limits (MDLs) in any subsequent (2nd through 8th) background sampling events.

A detailed discussion of background groundwater conditions can be found in the *2016 Background Sampling Report* (HDR, 2016b). Additional discussion of the statistical results can be found in **Section 4.0** of this report for a better understanding of predictive limits for the background well location BG-1 as well as interwell interactions. Additionally, further discussion of groundwater flow directions, horizontal hydraulic conductivities, horizontal hydraulic gradient calculations and groundwater flow velocities (i.e., seepage velocity) can be found in the *Design Hydrogeologic Report* (Buxton, 2015b).

3.2 2018 First Semi-Annual Detection Monitoring Groundwater Analytical Results

The focus of this section is the analytical results from the January 22-25, 2018 groundwater sampling event. Constituent concentrations with exceedances of respective 2L Standards for this event are provided below. The monitoring well location of the highest concentration for a given constituent is provided in parentheses.

A summary of the findings from this monitoring event is provided below and depicted in **Table 6**:

EPA Appendix III Constituent Detections

- Chloride: 19,700 to 1,180,000 µg/L (MW-2)
- Total Dissolved Solids: 246,000 to 2,300,000 µg/L (MW-2)

EPA Appendix IV Constituent Detections

- Antimony: <1.0 to 6.9 µg/L (MW-2)
- Barium: 106 to 1,210 µg/L (MW-8)
- Chromium: <7.7 µg/L to 56.8 µg/L (MW-7R)

EPA Appendix I Metal Detections

- No EPA Appendix I Metals were detected above the 2L Standards in any well.

EPA Appendix I VOC Detections

- No VOCs were detected in any well.

Standards have not been established under the NCGPS for detected constituents calcium, lithium, molybdenum, and radium 226/radium 228.

Appendix III and Appendix IV constituents have consistently been detected at elevated levels in all on-site monitoring wells, as well as the background monitoring well BG-1 throughout all sampling events at the Site. Elevated levels of these constituents were noted prior to the placement of CCR material and have remained generally consistent.

In this event, antimony, barium, chromium, chloride, and TDS were detected at concentrations above their respective 2L Standards. The presence of naturally occurring metals above the 2L Standard is common in North Carolina due to various geologic conditions. The presence of naturally occurring metals (i.e., weathering of crystalline parent material) was discussed in more detail in the *Initial Background Groundwater & Surface Water Monitoring Event* (Buxton, 2015c).

Brickhaven 2018 Spring Semi-Annual Detection Monitoring Report

Table 6: Analytical Detections and Exceedances

January 2018

		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-7R	MW-8	***NCGPS***	Equip. Blank	Amb. Blank	Duplicate (MW-6)	SW-1	SW-2	***NCSWWS***	Leachate-1
EPA APPENDIX III																		
Boron (µg/l)	7440-42-8	6.8	6.2	40.7	16.6	ND	11.2	6.8	13.8	10.1	*700*	ND	ND	5.4	12	14.2	*NS*	2,350
Calcium (µg/l)	7440-70-2	31,400	146,000	182,000	169,000	66,700	15,100	34,100	897,000	100,000	*NS*	ND	ND	33,900	7,630	16,200	*NS*	272,000
Chloride (µg/l)	16887-00-6	**271,000**	**547,000**	**1,180,000**	**987,000**	**492,000**	19,700	240,000	**279,000**	**390,000**	*250,000*	ND	ND	229,000	16,600	93,100	*250,000*	19,200
Fluoride (µg/l)	16984-48-8	140	120	280	460	320	680	520	120	ND	*2,000*	ND	ND	490	200	120	*1,800*	200
pH* (standard units)	pH	6.6	6.7	7.6	7.5	6.5	7.2	7.0	7.7	7.2	*6.5-8.5*	NT	NT	#N/A	NT	NT	*6.0-9.0*	7.5
Sulfate (µg/l)	14808-79-8	19,500	6,600	73,300	102,000	12,300	5,300	126,000	22,600	8,000	*250,000*	ND	ND	107,000	32,100	18,000	*250,000*	575,000
Total Dissolved Solids (µg/l)	TDS	**662,000**	**1,020,000**	**2,300,000**	**1,060,000**	**1,210,000**	246,000	**790,000**	**855,000**	**1,020,000**	*500,000*	ND	ND	774,000	334,000	258,000	*500,000*	1,280,000
EPA APPENDIX IV																		
Antimony (µg/l)	7440-36-0	ND	ND	**6.9**	**5.8**	ND	ND	ND	ND	ND	*1*	ND	ND	ND	ND	ND	*5.6*	ND
Arsenic (µg/l)	7440-38-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*10*	ND	ND	ND	ND	ND	*10*	18.7
Barium (ug/l)	7440-39-3	358	175	314	570	300	123	106	251	**1,210**	*700*	ND	ND	99.5	168	127	*1,000*	92.3
Beryllium (µg/l)	7440-41-7	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	ND	ND	ND	ND	ND	*6.5*	ND
Cadmium (µg/l)	7440-43-9	ND	ND	ND	ND	ND	ND	ND	ND	ND	*2*	ND	ND	ND	ND	ND	*2*	ND
Chromium (µg/l)	7440-47-3	ND	**18.4**	**56.8**	5.3	5.7	**15.3**	ND	**33**	**25.3**	*10*	ND	ND	ND	ND	ND	*50*	ND
Cobalt (µg/l)	7440-48-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*1*	ND	ND	ND	ND	ND	*3*	9.2
Fluoride (µg/l)	16984-48-8	140	120	280	460	320	680	520	120	ND	*2,000*	ND	ND	490	200	120	*1,800*	200
Lead (µg/l)	7439-92-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*15*	ND	ND	ND	8.7	ND	*25*	ND
Lithium (µg/l)	7439-93-2	17.8	33.3	96.6	90.2	28.6	7.1	53.7	24.7	25.3	*NS*	ND	ND	41.9	3.5	0.71	*NS*	48
Mercury (µg/l)	7439-97-6	ND	ND	ND	ND	ND	ND	0.32	ND	0.37	*1*	ND	ND	ND	ND	ND	*0.012*	ND
Molybdenum (µg/l)	7439-98-7	ND	ND	7.1	6.9	ND	ND	ND	ND	ND	*NS*	ND	ND	ND	ND	ND	*160*	261
Selenium (µg/l)	7782-49-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	ND	ND	ND	ND	ND	*5*	ND
Thallium (µg/l)	7440-28-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.28*	ND	ND	ND	ND	ND	*0.24*	0.77
Radium 226 (pCi/l)	13982-63-3	0.357	0.225	0.648	1.21	0	0.153	0.0517	0.0579	0.298	*NS*	0.048	0.324	0.278	-0.059	0.302	*NS*	0.238
Radium 228 (pCi/l)	15262-20-1	1.14	0.537	0.716	1.08	0.71	-0.069	1.07	0.393	0.427	*NS*	0.521	0.588	0.874	0.797	2.26	*NS*	1.06
EPA APPENDIX I METALS																		
Copper (µg/l)	7440-50-8	ND	ND	6.6	5.6	ND	6.9	ND	7.1	10.2	*1,000*	ND	ND	ND	6.4	ND	*7*	5.2
Nickel (µg/l)	7440-02-0	ND	13.3	33.8	ND	6.9	9	ND	18	13.8	*100*	ND	ND	ND	ND	ND	*88*	22.9
Silver (µg/l)	7440-22-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*20*	ND	ND	ND	ND	ND	*0.06*	ND
Vanadium (µg/l)	7440-62-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.3*	ND	ND	ND	14.6	ND	*NS*	14.9
Zinc (µg/l)	7440-66-6	ND	16.1	ND	ND	ND	ND	ND	ND	ND	*1,000*	ND	ND	ND	24.7	ND	*50*	30.8
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
Bromodichloromethane (µg/l)	75-27-4	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.6*	ND	ND	ND	ND	ND	*NS*	ND
Bromoform (µg/l)	75-25-2	ND	ND	ND	ND	ND	ND	ND	ND	ND	*4*	ND	ND	ND	ND	ND	*4.3*	ND
Chloroform (µg/l)	67-66-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	ND	ND	ND	ND	ND	*5.6*	ND
Dibromochloromethane (µg/l)	124-48-1	ND	ND	ND	ND	ND	ND	ND	ND	ND	*0.4*	ND	ND	ND	ND	ND	*NS*	ND
Carbon Disulfide (µg/l)	75-15-0	ND	ND	ND	ND	ND	ND	ND	ND	ND	*700*	ND	ND	ND	ND	ND	*NS*	ND
Dibromomethane (µg/l)	74-95-3	ND	ND	ND	ND	ND	ND	ND	ND	ND	*70*	ND	ND	ND	ND	ND	*47*	ND
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

Notes:

1. Groundwater, surface water, and leachate samples collected from January 22-25, 2018 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. 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
5. **Bold** and **shade** denotes above established NCGPS's or NCSWWS; µg/l = micrograms per liter; pCi/l - picocuries per liter
6. pH was field tested by Pace Analytical Laboratories
7. MW-7 was replaced by MW-7R by SAEDACCO on April 19, 2017

This page intentionally left blank.

3.3 Surface Water Analytical Results

Surface water samples (**Figure 3**) were compared to the North Carolina Surface Water and Wetland Standard (15A NCAC 02B) or EPA National Criteria standard (utilized by the North Carolina Division of Water Quality as default standards for parameters not listed in 15A NCAC 02B). Based on laboratory analytical data, no exceedances were detected above their respective standard listed in Rule 15A NCAC 02B in either of the surface water samples (SW-1 and SW-2) collected as part of this monitoring event.

3.4 Leachate Analytical Results

Leachate generated on-site was collected during the most recent monitoring event to characterize the nature of CCR leachate (**Figure 4**). Parameters remained similar when compared to prior sampling events.

Leachate sampling is required by the Permit to Operate and is disposed of in compliance with the Clean Water Act at either of the aforementioned permitted disposal facilities.

4 Statistics

4.1 Methodology

Background groundwater quality was evaluated such that statistically-derived background concentrations could be established for the Site. Groundwater quality in downgradient wells were then compared to background concentrations to determine if a statistically significant increase (SSI) over background has occurred, as required by Section .1600 rules of the North Carolina Solid Waste Management Rules 15A NCAC 13B. Sampling results used to establish background threshold values (BTVs) were obtained from well BG-1 during thirteen monitoring events performed between August 2015 and January 2018 (**Appendix D**). Downgradient sampling results from this detection monitoring round in January 2018 were used to evaluate for SSIs. Software packages ProUCL, NCSS and SPSS were used in the production of the statistics (ProUCL is offered by the USEPA; NCSS and SPSS are licensed software packages).

Groundwater samples collected as part of the monitoring program were analyzed for EPA Appendix III and Appendix IV constituents, Appendix I Metals, and Appendix I Volatile Organic Compounds (VOCs). Only non-filtered sample results were utilized for the statistical analysis of monitored constituents. The newly installed MW-7R was not included in this analysis due to the limited number of sample sets (i.e., less than four monitoring events).

4.1.1 Statistical Analysis

The background sample size (i.e., quantity of qualifying samples) was evaluated per constituent. Descriptive statistics were calculated for the background data set including non-detect (ND) values and excluding ND values. When NDs were included in the data set, the method detection limit (MDL) was substituted as the ND value for simple descriptive statistics. The analysis was performed with NDs removed to better understand the central tendency and range of the detected values.

Following the calculation of descriptive statistics the statistical analysis for the background data set was performed to evaluate for outliers, data distributions, and trends for Appendix III and IV constituents, Appendix I Metals, and Appendix I VOCs, where data quantity and quality permit.

For downgradient monitoring results, the data analysis included the calculation of descriptive statistics for Appendix III and IV constituents, Appendix I Metals, and Appendix I VOCs (for the data sets including and excluding ND values), followed by an evaluation of outliers and trends. A total of thirteen monitoring events (the twelve sampling rounds and the first detection monitoring round) were included for the descriptive analysis of the downgradient monitoring well results for the monitored constituents.

4.1.2 Outliers

Outliers are values that are not representative of the population from which they are sampled. The background and downgradient data sets were screened for outliers using the Dixon’s outlier test, which is suitable for data sets containing less than 25 samples. The outlier test was conducted using a significance of one percent. For constituents that had NDs, the NDs were removed prior to testing for outliers.

Statistical outliers were identified in the background data set evaluated for two Appendix III constituents (fluoride and total dissolved solids).

Statistical outliers were identified intermittently for numerous Appendix III and Appendix IV constituents and Appendix I Metals, in the data sets evaluated for downgradient monitoring wells throughout the monitoring period.

4.1.3 Data Distribution

Groundwater data was fitted to known distribution models using Goodness-of-Fit (GOF) tests incorporated into ProUCL. For data sets comprised of 50 or fewer samples, ProUCL's GOF module incorporates the Shapiro-Wilk GOF test to determine normal or lognormal distribution and Anderson-Darling to determine gamma distribution. Normal, lognormal and gamma distributions are parametric distributions. If a data set could not be fit with any of these three parametric distributions, it was considered to follow a nonparametric distribution.

Note that ProUCL does not provide GOF results for data sets with less than three detected values due to insufficient data. For purposes of estimating background concentrations, these data sets were treated under non-parametric distribution assumptions with the maximum detected value chosen to represent the background concentrations. In addition, the data for total radium is set to nonparametric as the MDL values were not provided by the laboratory.

4.1.4 Trends

Background constituent concentrations in groundwater should demonstrate stationary conditions through time, free of trends. Constituents were analyzed for trends within the data set using a maximum likelihood estimate (MLE) regression for constituents which followed parametric distributions and Mann-Kendall tests for those that were treated under nonparametric distributional assumptions. The MLE regression can be applied to data sets that can be fitted to a specific distribution model, and that contain NDs with multiple MDLs. The Mann-Kendall test is suitable for data series with no discernable distributions and only one MDL value for NDs.

Constituents treated under nonparametric data assumptions (either tested as nonparametric or having more than 50 percent NDs) and with multiple MDLs or with less than three detected values were not assessed for trends.

The background well regression analysis showed a potential decreasing trend for one Appendix III constituent (boron) and one Appendix I Metal (zinc). There were no increasing or decreasing trends identified for other monitoring constituents with sufficient data quantity and quality for testing with the MLE analysis or Mann-Kendall test. Although a statistical trend was identified for zinc and boron, the results can be misleading due to the short duration of the sampling program.

Trends were also evaluated for constituents in each downgradient well using the same methods as described above for the background data set. Trends were identified for select constituents at select monitoring well locations and should be monitored as additional downgradient groundwater data are collected at the site (**Section 4.2**).

4.2 Evaluation for SSIs over Background

The ChemStat® statistical analysis identified the parameters with a statistically significant increase (SSI) over the background levels for the down/side gradient wells. The results are summarized in **Table 7**.

Table 7: Summary of Evaluations for SSIs over Background for January 2018

Appendix III Constituents							
	Boron	**Calcium**	**Chloride**	**Fluoride**	**pH (Field)**	**Sulfate**	**TDS**
Unit	ug/L	ug/L	mg/L	mg/L	S.U.	mg/L	mg/L
BTV (UPL)	14.7	36,894	318	0.155	6.03 - 7.07*	23.2	2,630
MW-1	6.20	**146,000**	**547**	0.120	6.70	6.60	1,020
MW-2	**40.7**	**182,000**	**1,180**	**0.280**	**7.60**	**73.3**	2,300
MW-3	**16.6**	**169,000**	**987**	**0.460**	**7.50**	**102**	1,060
MW-4	1.50	**66,700**	**492**	**0.320**	6.50	12.3	1,210
MW-5	11.2	15,100	19.7	**0.680**	**7.20**	5.30	246
MW-6	5.40	33,900	229	**0.490**	7.00	**107**	774
MW-7	**22.7**	**53,200**	**382**	**0.210**	6.80	11.2	1,100
MW-8	10.1	**100,000**	**390**	0.0500	**7.20**	8.00	1,020

Appendix IV Constituents									
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Fluoride**	**Lead**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L
BTV (UPL)	3.90	5.00	434	0.500	0.500	2.50	2.50	0.155	2.50
Well	*First Detection Monitoring Round Results*								
MW-1	3.90	5.00	175	0.500	0.500	**18.4**	2.50	0.120	2.50
MW-2	**6.90**	5.00	314	0.500	0.500	**56.8**	2.50	**0.280**	2.50
MW-3	**5.80**	5.00	**570**	0.500	0.500	**5.30**	2.50	**0.460**	2.50
MW-4	3.90	5.00	300	0.500	0.500	**5.70**	2.50	**0.320**	2.50
MW-5	3.90	5.00	123	0.500	0.500	**15.3**	2.50	**0.680**	2.50
MW-6	3.90	5.00	99.5	0.500	0.500	2.50	2.50	**0.490**	2.50
MW-7	3.80	2.50	224	0.500	0.500	2.50	2.50	**0.210**	2.50
MW-8	3.90	5.00	**1,210**	0.500	0.500	**25.3**	2.50	0.0500	2.50

Table 7: Summary of Evaluations for SSIs over Background for January 2018 (con't)

	Lithium	Mercury	Moly-bdenum	Radium-226	Radium-228	Selenium	Thallium	Total Radium
Unit	ug/L	ug/L	ug/L	pCi/L	pCi/L	ug/L	ug/L	pCi/L
BTV (UPL)	36.8	0.100	6.80	1.14	2.59	5.00	13.7	2.39
Well	*First Detection Monitoring Round Results*							
MW-1	33.3	0.100	2.50	0.225	0.537	5.00	0.0300	0.762
MW-2	**96.6**	0.100	**7.10**	0.648	0.716	5.00	0.0300	1.36
MW-3	**90.2**	0.100	**6.90**	**1.21**	1.08	5.00	0.0300	2.29
MW-4	28.6	0.100	2.50	0.00	0.710	5.00	0.0300	0.710
MW-5	7.10	0.100	2.50	0.153	-0.0690	5.00	0.0300	0.153
MW-6	**41.9**	0.100	2.50	0.278	0.874	5.00	0.0300	1.15
MW-7	23.0	0.100	2.50	0.00	0.0190	5.00	5.00	0.0190
MW-8	25.3	**0.370**	2.50	0.298	0.427	5.00	0.0300	0.725

	Appendix I Metals				
	Copper	**Nickel**	**Silver**	**Vanadium**	**Zinc**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	2.50	2.50	2.50	6.00	10.0
Well	*First Detection Monitoring Round Results*				
MW-1	2.50	**13.3**	2.50	2.50	**16.1**
MW-2	**6.60**	**33.8**	2.50	2.50	5.00
MW-3	**5.60**	2.50	2.50	2.50	5.00
MW-4	2.50	**6.90**	2.50	2.50	5.00
MW-5	**6.90**	**9.00**	2.50	2.50	5.00
MW-6	2.50	2.50	2.50	2.50	5.00
MW-7	2.50	2.50	2.50	2.50	5.00
MW-8	**10.2**	**13.8**	2.50	2.50	5.00

Notes:
Bold and underlined concentration indicates an SSI over background

Based on the statistical evaluations performed, BTVs were determined for the detection monitoring program at the Site for Appendix III and IV constituents and Appendix I Metals (Note that BTVs were not calculated for Appendix I VOCs as all of these constituents were 100 percent non-detects). The BTV provided for detection monitoring constituents is the statistically-derived background concentration (i.e., upper prediction limit [UPL]).

The calculated background concentrations, or BTVs, for each detection monitoring constituent is provided above. All remaining monitored constituents either are not detected, not above the MDL or are not statistically significant above the background concentration levels.

4.3 Statistical Summary

Note that the BTVs were calculated using well BG-1 as the background monitoring well. However, nine monitoring wells (MW-1 through MW-8 and BG-1) were installed and sampled twice (August and October 2015) prior to ash placement, thus representing pre-ash conditions at the site. When results of the January 2018 sampling event are compared to the pre-ash sampling results from those nine wells, current groundwater constituent concentrations are generally similar to concentrations reported prior to ash placement.

5 Conclusion

The 2018 First Semi-Annual Detection Monitoring event was conducted at the Brickhaven No. 2 Mine Tract "A" Structural Fill site from January 22-25, 2018. A summary of the findings from the 2018 First Semi-Annual Detection monitoring event is provided below**.**

5.1 Groundwater

- Constituents above established 2L Standards were detected in MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7R, MW-8 and the background monitoring well BG-1.
- Standards have not been established by NCDEQ for the detected constituents: calcium, lithium, molybdenum, and radium 226/ radium 228.
- 2L Standard exceedances of EPA Appendix III constituent's chloride and TDS were detected in groundwater samples collected during this monitoring event at all monitoring well locations with the exception of MW-5 for TDS as well as MW-5 and MW-6 for chloride.
- 2L Standard exceedances of EPA Appendix IV constituent's antimony (MW-2 and MW-3), barium (MW-8), and chromium (MW-1, MW-2, MW-5, MW-7R, and MW-8) were detected in groundwater samples collected during this monitoring event.
- All EPA Appendix I Metals and VOC's were below their respective 2L Standards.
- Groundwater concentrations remained consistent with previous sampling events including those completed prior to CCR material placement.

5.2 Surface Water

- No surface water exceedances were detected at levels above the laboratory MDL and remain below their respective 15A NCAC 02B Standards from this sampling event.
- Concentrations of Appendix III and Appendix IV constituents and Appendix I Metals, remain consistent with concentrations of samples including prior exceedances collected during previous sampling events including those sampling events conducted prior to CCR material placement.

5.3 Leachate

- Appendix III, Appendix IV, and Appendix I Metals concentrations remained consistent with previous sampling events (i.e., no significant increases or decreases) based on laboratory analysis of the Leachate sample collected as part of this sampling event.

5.4 Statistical Analysis

- The analysis is based on an interwell analysis consisting of 13 monitoring events of the background well BG-1 (five more than the required eight). Additional subsequent sampling events could provide greater refinement and confidence of statistical significance.
- Statistical outliers were identified in the background data set evaluated for fluoride and TDS. Intermittent Appendix III and Appendix IV constituents and Appendix I Metals, in the data sets evaluated for downgradient monitoring wells, were noted throughout the

monitoring period and were determined to be outliers relative to all of the parameter values collected over the 13 monitoring events from all wells to date.

- **Table 7** depicts those parameters with statistical significance compared to background at each well location.
- Although BTVs were calculated using well BG-1 as the background monitoring well, the nine monitoring wells (MW-1 through MW-8 and BG-1) were installed and sampled twice (August and October 2015) prior to ash placement, thus representing pre-ash conditions at the site. When results of the January 2018 sampling event are compared to the pre-ash sampling results from those nine wells, current groundwater constituent concentrations are generally similar to concentrations reported prior to ash placement.

5.5 Overall Summary

Based on laboratory data from samples collected as part of this monitoring event, detections are similar to the background and pre-CCR placement concentrations and remain absent from, or orders of magnitude higher than onsite leachate samples collected; therefore, CCR material placement at the Brickhaven Site does not appear to have an impact to groundwater or surface water in the vicinity of the site.

6 Recommendations

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

- Incorporate MW-7R into statistical analysis after four sampling events.
- Continue to sample semi-annually per the approved Water Quality Sampling Plan as well as incorporating Chatham County quarterly split sampling to improve dataset for greater statistical confidence and refinement.
- Evaluate the validity of SSIs by further assessing sampling protocols/performance, spatial variability, and seasonality on constituent concentrations as additional sampling rounds are conducted.
- Further communication and evaluation with NCDEQ related to ongoing detection monitoring and conclusions.

The information above summarizes the findings from the detection monitoring event. HDR believes that the SSIs are a result of limited background data along with natural and seasonal variations at the site and therefore has proposed additional investigative steps to evaluate the data previously collected in addition to expanding the dataset moving forward. HDR will continue to report the findings as a part of the semi-annual detection monitoring events.

7 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.*

Buxton Environmental. 2015c*. Initial Background Groundwater & Surface Water Monitoring Event.* October 2015.

Buxton Environmental. 2016. *Design Hydrogeologic Report for Brickhaven No.2 Mine Tract "A" Structural Fill. Addendum 2, March 2016.*

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.*

HDR. 2016b. *Background Sampling Report. November 2016.*

HDR. 2017. *2017 Initial Semi-Annual Detection Monitoring Report. January 2017.*

HDR. 2017b. *2017 Semi-Annual Detection Monitoring Report. October 2017.*

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.*

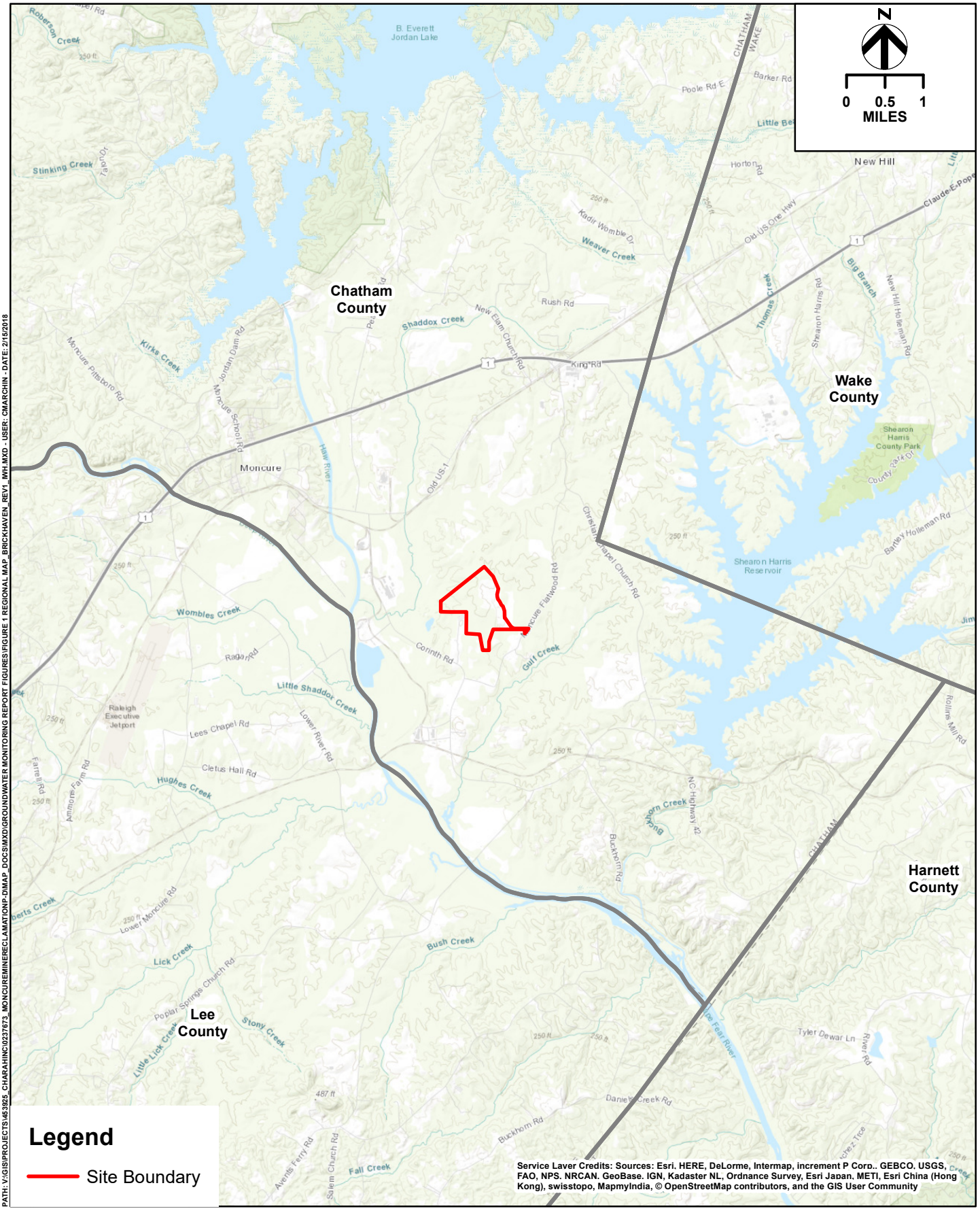
Singhal, B. B.S. and R. P. Gupta. 2010*. Applied Hydrogeology of Fractured Rocks: Springer, 2nd Edition*, 408p. (Table 8-1, p. 140)

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

Figures

Figure 1: Regional Site Location Map
Figure 2: Potentiometric Surface Map – January 2018
Figure 3: Surface Water Sample Location Map
Figure 4: Leachate Sample Collection Location

This page intentionally left blank.



PATH: V:\GIS\PROJECTS\463825_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-DIMAP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\FIGURE 1 REGIONAL MAP_BRICKHAVEN_REV1_WH.MXD - USER: CMARCHIN - DATE: 2/16/2018

REGIONAL SITE LOCATION MAP
CHARAH, LLC
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

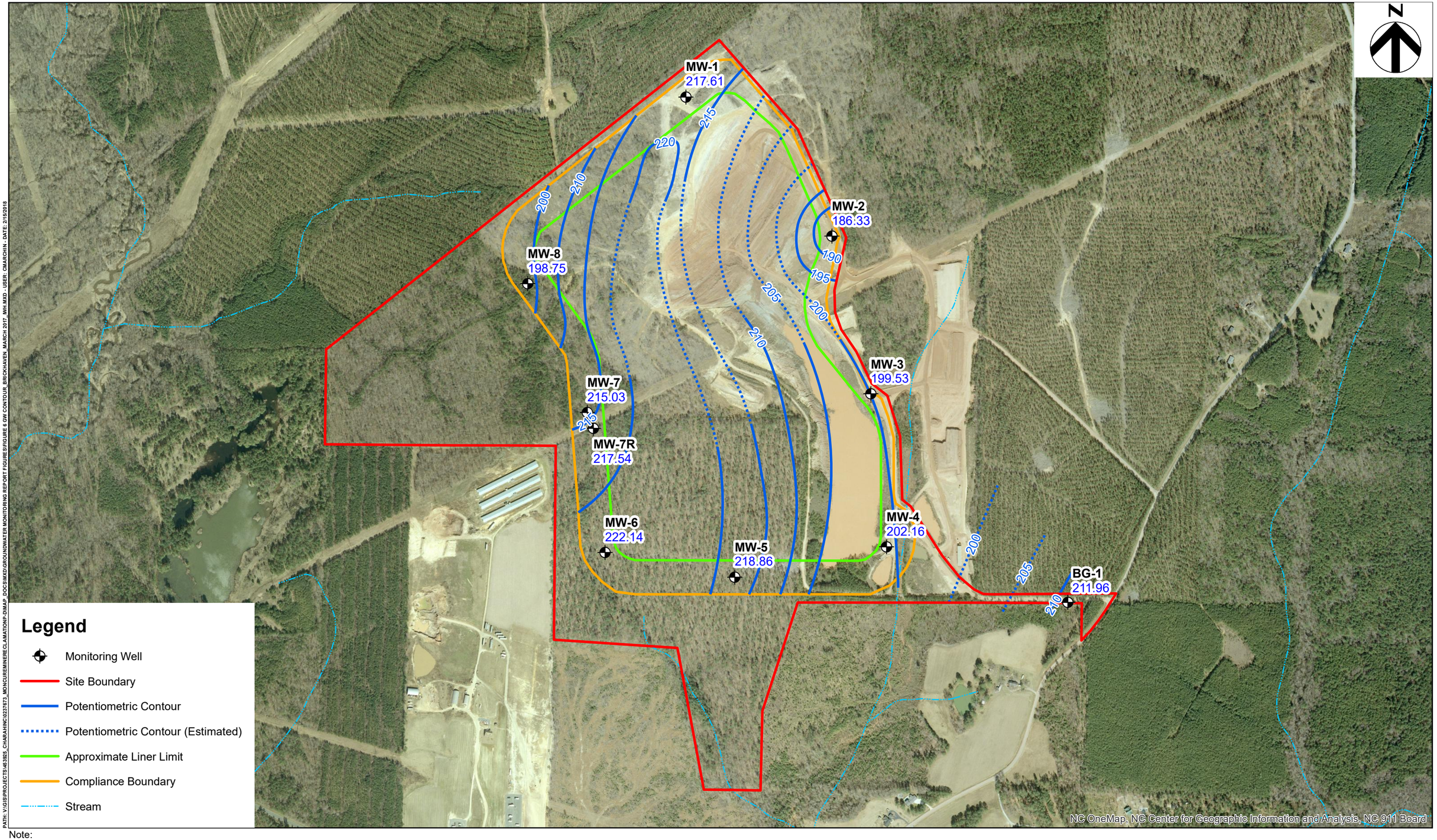
DATE

APRIL 2018

FIGURE

1

This page intentionally left blank.



PATH: V:\GIS\PROJECTS\453925_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-D\MAP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\FIGURE 6 GW CONTOUR_BRICKHAVEN_MARCH 2017_WH.MXD - USER: CMARCHIN - DATE: 2/15/2018

Note:
1. Groundwater data was collected by Pace Analytical on January 22, 2018.

0 150 300 600 900 1,200 Feet

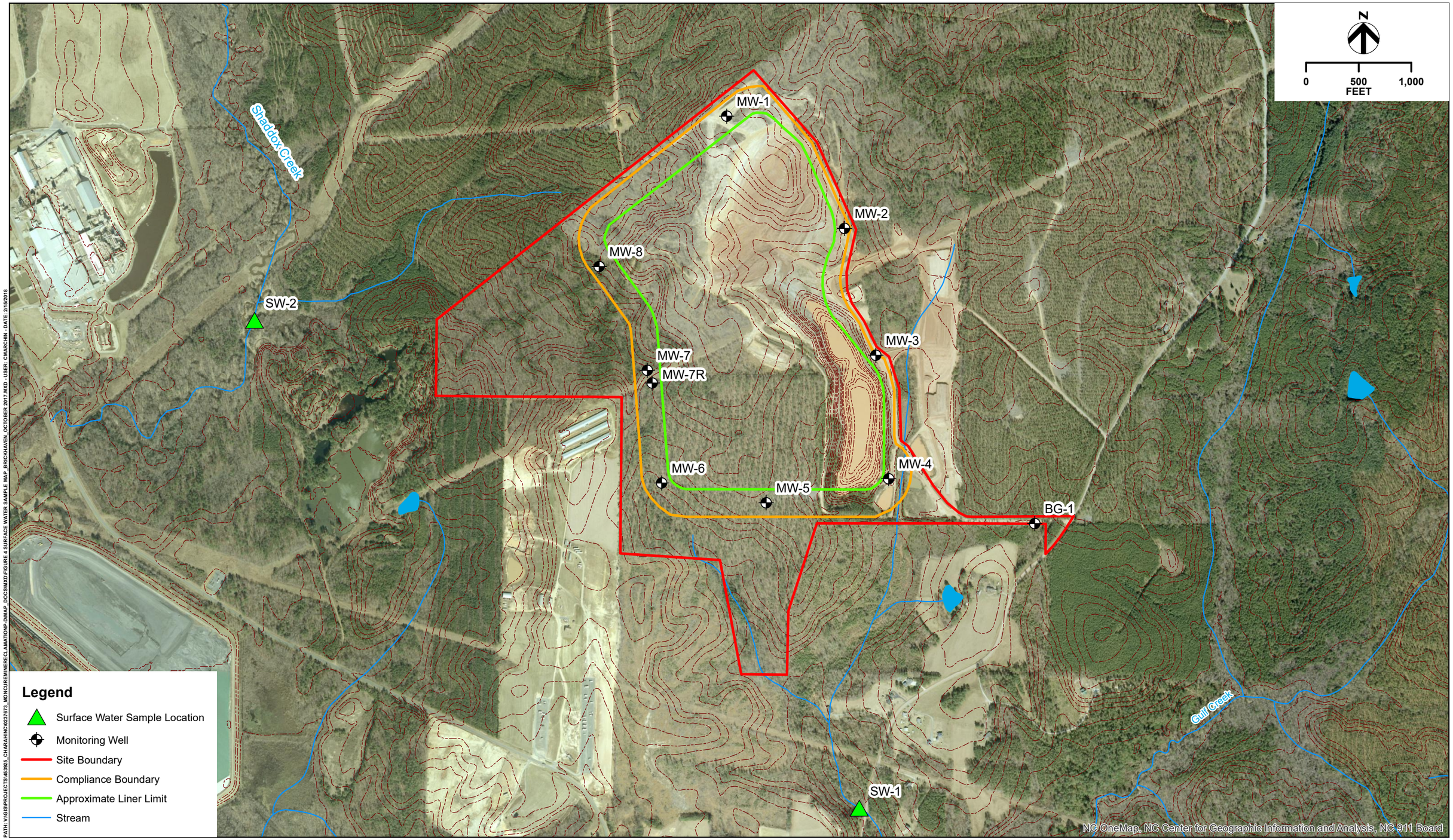
HDR

WATER TABLE SURFACE MAP - JANUARY 2018
CHARAH, LLC
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
APRIL 2018

FIGURE
2



PATH: V:\GIS\PROJECTS\463925_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-DMAP_DOCS\MXD\FIGURE 4 SURFACE WATER SAMPLE MAP_BRICKHAVEN_OCTOBER 2017.MXD - USER: CMARCHIN - DATE: 2/15/2018

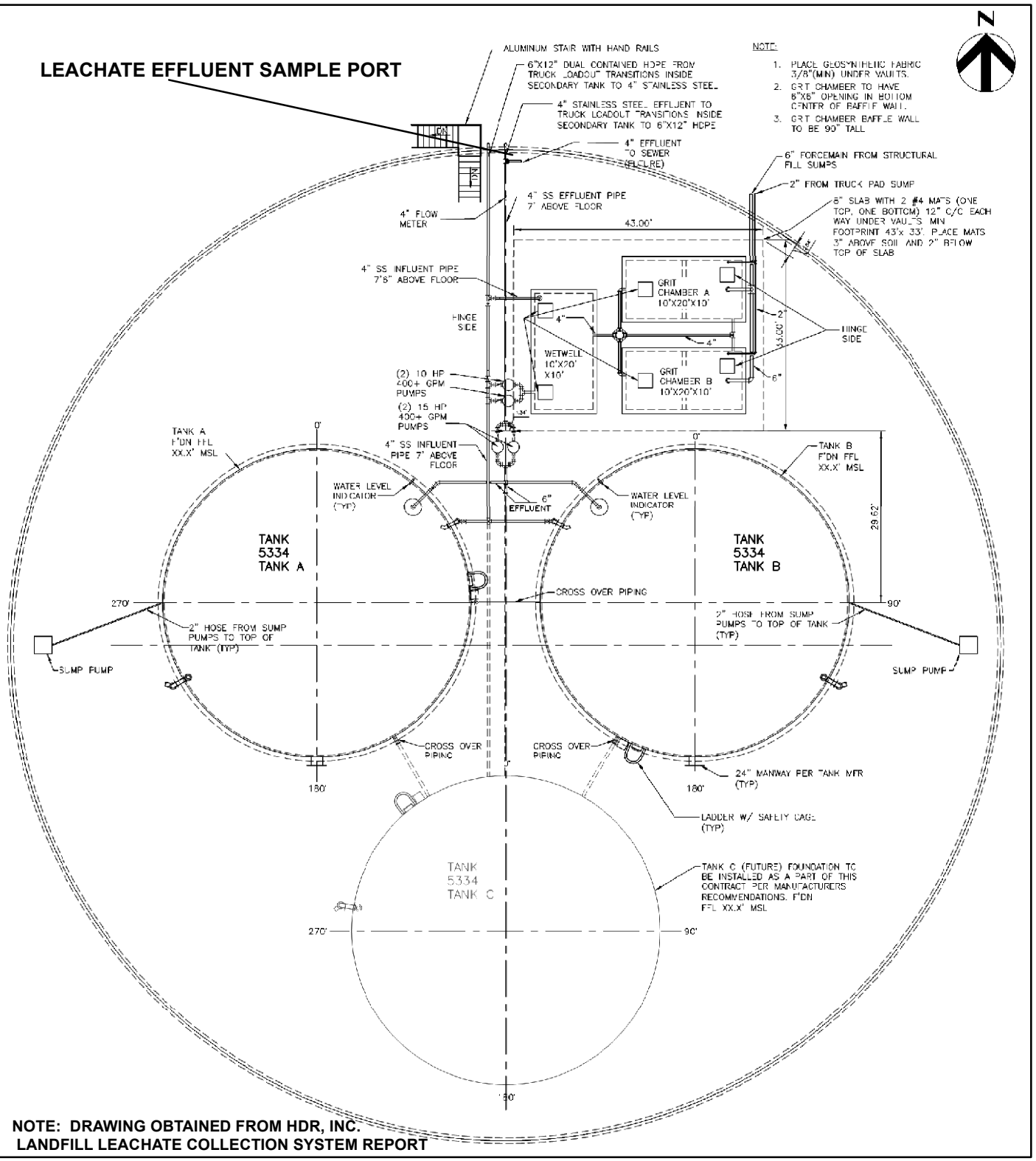
HDR

SURFACE WATER SAMPLE LOCATION MAP
CHARAH, LLC
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
APRIL 2018

FIGURE
3



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

PATH: V:\GIS\PROJECTS\453925_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-DMAP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\FIGURE 5 LEACHATE LOCATIONS_BRICKHAVEN_IWH.MXD - USER: CMARCHIN - DATE: 2/15/2018

LEACHATE SAMPLE COLLECTION LOCATION
CHARAH, LLC
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE APRIL 2018

FIGURE 4

This page intentionally left blank.

A

Appendix A – Field Data Sheets

This page intentionally left blank.

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CLARIANT - HOR Location: BRICKHAVEN Project #: BRICKHAVEN L.F.

Name and Afiliation (Sampler(s): JFA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 16.23 ft Casing Volume: 4.49 gallons

Height of Water Column: 27.55 ft Cal. 3 Volumes: 13.47 gallons

Pump Intake: 42.5 ft

Purge Information

Date Purged: 1 / 22 / 18 Start: 1100 Finish: 1120 Purge Rate: 140 mL/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 2600 (gallons / mls)

Sampling Information

Date Collected: 1/22/18 Time Collected: 1125 (am / pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 13470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 13.3 Time: 1125 Turbidity (ntu): 3.4 Time: 1125

Diss Oxy (mg/L): 0.3 Time: 1125 Fe 2+ mg/L: ND Time: 1125

Specific Cond. (uS): 1219 Time: 1125 Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.6 Time: 1125 Odor: ND Time: 1125

ReDox (mV): 274.1 Time: 1125 Appearance: CLEAR Time: 1125

ReDox (EH value):YSI ProPlus +200mV 274.1 Other: Time: —

General/Weather Observations:

(sunny / cloudy / rainy) Temp. 45 (°F) Wind 0-5 (mph)

Sampler Signature: Date: 1-22-17

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons / mls)	Water level (ft)	Other
1105	12.0	1.4	1221	6.6	97.6	5.5	500	16.80	FLOW 140
1110 ~~1100~~	13.0	0.4	1217	6.6	85.7	5.1	1200	17.08	
1115	13.1	0.3	1225	6.6	77.5	3.8	1900	17.22	
1120	13.3	0.3	1221	6.6	74.9	5.8	2600	17.38	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR-CHARAH Location: BRICKHAVEN NC Project #: BRICKHAVEN L.F. Q1

Name and Afiliation (Sampler(s): JFA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW-2 RA 1

Well Locked: (YES / NO)

Well Diameter: 2

Construction: (PVC/Steel/Stainless Steel)

Total Well Depth: 75.55 ft

Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 62.78 ft

Casing Volume: 2.08 gallons

Height of Water Column: 12.77 ft

Cal. 3 Volumes: 6.24 gallons

Pump Intake: 73.5 ft

Purge Information

Date Purged: 1 / 25 / 18 Start: 1250 Finish: 1455 Purge Rate: 150 ml/m

Purging Method: SS SUB PUMP Total Volume Purged: 18750 (gallons/mls)

Sampling Information

Date Collected: 1 / 25 / 18 Time Collected: 1500 (am/pm)

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 18.5 Time: 1500 Turbidity (ntu): 9.4 Time: 1500

Diss Oxy (mg/L): 0.7 Time: — Fe 2+ mg/L: ND Time: 1500

Specific Cond. (uS): 1983 Time: — Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.7 Time: — Odor: ND Time: 1500

ReDox (mV): 77.4 Time: 1500 Appearance: CLEAR Time: 1500

ReDox (EH value):YSI ProPlus +200mV 277.4 Other: — Time: —

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 45 (°F) Wind 0-5 (mph)

Sampler Signature: [signature] Date: 1-25-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1255	17.6	0.6	2006	6.8	23.9	477.7	750	62.63	
1300	18.8	1.0	776	7.3	62.3	448.8	1500	62.63	
1305	19.0	1.1	670	7.2	60.7	448.9	2250	62.63	
1310	19.1	1.1	648	7.2	56.4	349.9	3000	62.63	
1315	19.1	1.1	672	7.2	45.7	391.1	3750	62.63	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: HDR - CHARAH

Location: BRUNSWICK NC.

Project: BRUNSWICK LF 1Q

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1320	18.5	0.8	1222	7.0	44.3	261.9	4500	62.61	62.61
1325	18.3	0.9	1116	7.0	42.1	179.2	5250	62.62	62.62
1330	18.5	0.9	998	7.1	44.1	141.2	6000		62.62
1335	18.6	0.9	932	7.1	46.9	134.4	6750	62.63	
1340	18.5	1.1	964	7.1	54.5	107.3	7500	62.63	
1345	18.4	1.1	1006	7.1	50.9	91.4	8250	62.63	
1350	18.5	1.0	1039	7.0	51.8	75.7	9000	62.62	
1355	18.5	1.0	1116	7.0	53.7	60.4	9750	62.62	
1400	18.6	1.0	1205	7.0	56.5	45.3	10500	62.62	
1405	18.5	0.9	1268	7.0	58.9	25.7	11250	62.62	
1410	18.7	0.9	1374	6.9	61.3	21.4	12000	62.62	
1415	18.6	0.9	1460	6.9	63.9	21.8	12750	62.62	
1420	18.7	0.9	1512	6.9	65.6	12.5	13500	62.62	
1425	18.6	0.9	1566	6.9	67.3	14.0	14250	62.62	
1430	18.4	0.8	1665	6.8	70.5	13.1	15000	62.62	
1435	18.6	0.9	1726	6.8	71.4	11.4	15750	62.62	
1440	18.8	0.8	1802	6.8	73.7	12.1	16500	62.62	
1445	18.1	0.8	1895	6.8	75.5	10.0	17250	62.62	
1450	18.3	0.8	1936	6.8	76.5	9.2	18000	62.61	
1455	18.6	0.7	1970	6.8	77.0	9.3	18750	62.63	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH / ITDR Location: BUCKHANNON - NC Project #: BUCKHANNON L.F. 19

Name and Affiliation (Sampler(s): JFA - PACE ANALYTICAL

Name and Affiliation (Inspector): NA

Well Information

Well ID: MW 2

Well Diameter: 2

Total Well Depth: 50.15 ft

Static Water Level: 44.58 ft

Height of Water Column: 5.57 ft

Well Locked: (YES / NO)

Construction: (PVC / Steel / Stainless Steel)

Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 0.91 gallons

Cal. 3 Volumes: 2.7 gallons

Pump Intake: ~~49.0~~ ft

Purge Information

Date Purged: 1 / 25 / 18 Start: 1610 Finish: 1715 Purge Rate: 100 ↓ 50 mL/m

Purging Method: SS SUB PUMP Total Volume Purged: 4250 (gallons/mls)

Sampling Information

Date Collected: 1 / 25 / 18 Time Collected: 1720 (am/pm)

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 9470

Bottle Type	Preservation	Analysis Required
		SUBCON KIT

Field Measurements/Observations

Sample Temp (°C): 12.2 Time: 1720 Turbidity (ntu): 9.9 Time: 1720

Diss Oxy (mg/L): 4.7 Time: Fe 2+ mg/L: ND Time: 1720

Specific Cond. (uS): 4338 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 7.6 Time: Odor: NO Time: 1720

ReDox (mV): 68.7 Time: 1720 Appearance: CLEAR Time: 1720

ReDox (EH value): YSI ProPlus +200mV 268.7 Other: — Time: —

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 40 (°F) Wind 0-5 (mph)

Sampler Signature: Joe Ard Date: 1-25-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1615	15.6	5.7	4366	7.6	112.6	25.7	500	45.15	
1620	13.8	5.5	4350	7.6	103.8	39.6	1000	45.29	PUMP
1625	13.9	5.3	4345	7.6	100.7	39.2	1500	44.42	ADJ
1630	13.3	5.5	4359	7.6	94.2	35.6	2000	—	↓
1635	12.4	5.5	4343	7.6	89.5	29.1	2250	45.82	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: CHARAH / TVA

Location: BRICKHAVEN NC

Project: BRICKHAVEN L.F. Q1

Well ID: MW2

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1640	12.6	5.2	4336	7.6	81.3	22.3	2500	45.96	
1645	12.2	5.2	4337	7.6	78.5	18.2	~~3000~~ 2750	46.19	
1650	11.8	5.0	4339	7.6	74.4	18.1	3000	46.29	
1655	12.0	5.3	4337	7.62	67.2	14.95	3250	46.50	
1700	12.2	5.3	4330	7.6	66.3	10.1	3500	46.61	
1705	12.2	4.8	4338	7.6	65.5	9.5	3750	46.74	
1710	12.3	4.7	4340	7.6	66.7	9.9	4000	46.97	
1715	12.2	4.8	4340	7.6	68.1	9.9	4250	47.05	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CITRAV/ITDR Location: BRICKHAVEN Project #: BRICKHAVEN LF 1Q

Name and Afiliation (Sampler(s)): JFA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 23.00 ft Casing Volume: 3.36 gallons

Height of Water Column: 20.60 ft Cal. 3 Volumes: 10.08 gallons

Pump Intake: 42.15 ft

Purge Information

Date Purged: 1/24/18 Start: 1450 Finish: 1515 Purge Rate: 100 mL/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 2500 (gallons/mls)

Sampling Information

Date Collected: 1/24/18 Time Collected: 1520 (am/pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 16.3 Time: 1525 Turbidity (ntu): 1.3 Time: 1525

Diss Oxy (mg/L): 2.4 Time: Fe 2+ mg/L: ND Time: 1525

Specific Cond. (uS): 3909 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 7.5 Time: Odor: ND Time: 1525

ReDox (mV): 42.1 Time: Appearance: CLEAR Time: 1525

ReDox (EH value): YSI ProPlus +200mV 242.1 Other: — Time: —

General/Weather Observations: _____

(sunny/cloudy/rainy) Temp. 40 (°F) Wind 5-10 (mph)

Sampler Signature: [signature] Date: 1-24-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1455	16.0	2.8	3267	7.5	68.4	7.0	500	23.77	
1500	16.1	2.0	3896	7.5	-0.1	2.4	1000	23.88	
1505	16.4	2.3	3882	7.5	1.5	2.9	1500	24.48	
1510	16.6	2.4	3884	7.5	20.8	2.4	2000	24.98	
1515	16.3	2.4	3889	7.5	34.3	2.5	2500	25.60	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH/ITOR Location: BRACKHAVEN NC Project #: BRACK HAVEN 2.F. 1Q

Name and Affiliation (Sampler(s)): JFA - PACE ANALYTICAL

Name and Affiliation (Inspector): NA

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*: 163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 14.89 ft Casing Volume: 1.77 gallons

Height of Water Column: 10.85 ft Cal. 3 Volumes: 5.31 gallons

Pump Intake: 24 ft

Purge Information

Date Purged: 1/24/18 Start: 1145 Finish: 1240 Purge Rate: 100 ml/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 5500 (gallons/mls)

Sampling Information

Date Collected: 1/24/18 Time Collected: 1245 (am/pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED RLT

Field Measurements/Observations

Sample Temp (°C): 16.7 Time: 1245 Turbidity (ntu): 9.1 Time: 1245

Diss Oxy (mg/L): 0.1 Time: Fe 2+ mg/L: 3.5 Time: 1245

Specific Cond. (uS): 2188 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.5 Time: Odor: ND Time: 1245

ReDox (mV): -44.8 Time: Appearance: CLEAR Time: 1245

ReDox (EH value): YSI ProPlus +200mV 155.2 Other: Time: —

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 48 (°F) Wind 5-10 (mph)

Sampler Signature: Date: 1-24-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1150	16.3	1.2	1909	6.5	17.2	56.4	500	15.31	
1155	16.2	0.3	2005	6.5	-35.7	30.9	1000	15.44	
1200	16.4	0.2	2055	6.5	-54.0	25.3	1500	15.60	
1205	16.5	0.2	2099	6.5	-63.3	24.5	2000	15.64	
1210	16.3	0.3	2127	6.5	-63.3	20.4	2500	15.68	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: CHARAH / ITOR

Location: BRICKHAVEN N.C.

Project: BRICKHAVEN L.F. 1Q

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1215	16.5	0.2	2148	6.5	-60.8	16.4	3000	15.70	
1220	16.4	0.1	2164	6.5	-59.0	16.4	3500	15.73	
1225	16.5	0.1	2168	6.5	-56.7	15.0	4000	15.73	
1230	16.4	0.2	2174	6.5	-54.6	12.6	4500	15.74	
1234	16.4	0.1	2182	6.5	-52.3	11.5	5000	15.75	
1240	17.0	0.1	2174	6.5	-47.1	9.2	5500	15.75	

Field Data Sheet

Client: CHARAH / LOR Location: BRICKHAVEN NC Project #: BRICKHAVEN LF 1Q

Name and Afiliation (Sampler(s)): JF-A PACE ANALYTICAL

Name and Afiliation (Inspector): N/A

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 25.96 ft Casing Volume: 3.42 gallons

Height of Water Column: 21 ft Cal. 3 Volumes: 10.26 gallons

Pump Intake: 45 ft

Purge Information

Date Purged: 1/25/18 Start: 900 Finish: 950 Purge Rate: 100 mL/m

Purging Method: SS SUB PUMP Total Volume Purged: 5000 (gallons / mls)

Sampling Information

Date Collected: 1/25/18 Time Collected: 955 (am / pm)

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SHIPPED RT

Field Measurements/Observations

Sample Temp (°C): 6.8 Time: 955 Turbidity (ntu): 9.66 Time: 955

Diss Oxy (mg/L): 0.5 Time: Fe 2+ mg/L: ND Time: 955

Specific Cond. (uS): 466.3 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 7.2 Time: Odor: ND Time: 955

ReDox (mV): 20.7 Time: 955 Appearance: CLEAR Time: 955

ReDox (EH value): YSI ProPlus +200mV 220.7 Other: Time:

General/Weather Observations:

(sunny / cloudy / rainy) Temp. 28 (°F) Wind 5-10 (mph)

Sampler Signature: Joel Alf Date: 1-25-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons / mls)	Water level (ft)	Other
905	7.9	0.9	563.2	7.4	21.4	25.7	500	26.56	
910	6.3	0.9	561.9	7.4	61.6	27.0	1000	—	
915	5.8	0.8	555.9	7.4	67.2	21.4	1500	27.50	
920	6.2	0.6	552.0	7.5	60.0	19.5	2000	—	
925	7.0	0.6	548.7	7.4	42.2	20.0	2500	28.54	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: CHARAH - HDR

Location: BRICKHAVEN

Project: BRICKHAVEN LF - Q1

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
930	7.1	0.5	527.7	7.4	32.9	~~17~~ 14.8	3000	—	
935	7.0	0.5	506.7	7.3	26.6	13.2	3500	29.18	
940	7.5	0.5	483.7	7.3	23.7	12.1	4000	—	
945	7.1	0.5	478.3	7.2	22.7	13.1	4500	29.58	
950	7.0	0.5	470.2	7.2	21.4	9.6	5000	—	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH, INC Location: BRICKHAVEN Project #: BRICKHAVEN LF Q1

Name and Afiliation (Sampler(s): JFA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 8.90 ft Casing Volume: 3.10 gallons

Height of Water Column: 19.03 ft Cal. 3 Volumes: 9.30 gallons

Pump Intake: 26.0 ft

Purge Information

Date Purged: 1/24/18 Start: 905 Finish: 925 Purge Rate: 100 mL/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 2000 (gallons/mls)

Sampling Information

Date Collected: 1/24/18 Time Collected: 930 (am)/pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SAMPLED IN SITU

Field Measurements/Observations

Sample Temp (°C): 14.4 Time: 930 Turbidity (ntu): 3.7 Time: 930

Diss Oxy (mg/L): 1.5 Time: Fe 2+ mg/L: ND Time: 910

Specific Cond. (uS): 1358 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 7.0 Time: Odor: NO Time: 930

ReDox (mV): 197.8 Time: Appearance: CLEAR Time: 930

ReDox (EH value):YSI ProPlus +200mV 397.8 Other: — Time: —

General/Weather Observations:

(sunny)/cloudy/rainy) Temp. 40 (°F) Wind 0-5 (mph)

Sampler Signature: Joe Art Date: 1-24-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/(mls))	Water level (ft)	Other
910	13.7	1.7	1376	7.0	214.3	9.22	500	9.38	
915	13.7	1.6	1368	7.0	214.1	6.3	1000	9.48	
920	14.0	1.5	1365	7.0	210.3	4.2	1500	9.58	
925	14.4	1.5	1364	7.0	202.9	3.8	2000	9.63	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH/TVDR Location: BRICKHAVEN Project #: BRICKHAVEN 2.F Q1

Name and Afiliation (Sampler(s): JFA - PACE ANALYTICAL

Name and Afiliation (Inspector):

Well Information

Well ID: MW 7R

Well Diameter: 2

Total Well Depth: 39.94 ft

Static Water Level: 24.36 ft

Height of Water Column: 15.58 ft

Well Locked: (YES) NO)

Construction: (PVC/Steel/Stainless Steel)

Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 2.54 gallons

Cal. 3 Volumes: 7.62 gallons

Pump Intake: 37.5 ft

Purge Information

Date Purged: 1/23/18 Start: 1445 Finish: 1645 Purge Rate: 100 ml/m

Purging Method: SS SUB PUMP Total Volume Purged: 12.000 (gallons/(mls))

Sampling Information

Date Collected: 1/23/18 Time Collected: 1650 (am/(pm))

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KEI

Field Measurements/Observations

Sample Temp (°C): 16.3 Time: 1650 Turbidity (ntu): 8.4 Time: 1650

Diss Oxy (mg/L): 2.2 Time: 1650 Fe 2+ mg/L: ND Time:

Specific Cond. (uS): 1465 Time: Res. Cl (mg/L)/(µg/L): Time:

Sample pH (s.u.): 7.7 Time: Odor: ND Time:

ReDox (mV): 111.4 Time: Appearance: CLEAR Time:

ReDox (EH value):YSI ProPlus +200mV 311.4 Other: Time:

General/Weather Observations: TURBIDITY INCREASED DURING SAMPLING - 20 NTU PLUS/MINUS - SAMPLED

(sunny/cloudy/rainy) Temp. 60 (°F) Wind 20-25 (mph)

Sampler Signature: Date: 1-23-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/(mls))	Water level (ft)	Other
1450	19.9	1.9	1479	7.6	151.7	5058	500	25.08	
1455	20.2	1.9	1483	7.6	148.3	356.7	1000	25.43	
1500	20.2	1.7	1485	7.6	143.5	209.3	1500	25.73	
1505	20.0	1.7	1486	7.7	140.4	142.2	2000	25.93	
1510	20.0	1.7	1481	7.7	137.1	110.5	2500	26.18	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: CHARAH / HDR

Location: BRACKHAVEN N.C.

Project: BRACKHAVEN LF 1Q

Well ID: MW 7R

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1515	20.0	1.8	1477	7.7	133.1	95.0	3000	26.35	
1520	20.1	1.8	1478	7.7	130.7	68.9	3500	26.78	
0525	20.2	1.8	1478	7.7	128.2	62.0	4000	26.90	
1530	20.0	1.8	1478	7.7	126.0	47.7	4500	26.90	
1535	19.8	1.9	1478	7.7	124.2	42.7	5000	27.07	
1540 ~~1540~~	~~1540~~	19.6	1.9	1473	7.7	121.0	40.9	5500	27.27
1545 ~~1545~~	~~1545~~	19.3	2.0	1473	7.7	121.0	38.1	6000	27.37
1550 ~~1550~~	~~1550~~	19.2	2.0	1471	7.7	120.4	24.8	6500	27.43
~~1558~~	~~1558~~	19.2	2.0	1471	7.7	119.3	23.3	7000	—
1600	19.2	2.0	1472	7.7	118.3	20.8	7500	27.61	
1605	19.0	2.1	1472	7.7	117.3	14.2	8000	27.72	
1610	18.7	2.0	1471	7.7	116.5	15.1	8500	27.83	
1615	18.3	2.1	1470	7.7	115.8	15.1	9000	27.88	
1620	17.9	2.1	1470	7.7	115.1	16.3	9500	28.08	
1625 ~~1624~~	~~1624~~	17.8	2.1	1468	7.7	113.6	24.6	10000	28.20
1630	17.6	2.2	1468	7.7	112.1	16.7	10500	28.29	
1635	17.4	2.2	1467	7.7	111.6	13.2	11000	28.39	
1640	17.0	2.2	1468	7.7	111.8	10.01	11500	28.43	
1645	16.5	2.2	1465	7.7	111.4	8.4	12000		

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH/ITOR Location: BRICKHAVEN NC Project #: BRICKHAVEN L.F. C21

Name and Affiliation (Sampler(s)): JFA PACE ANALYTICAL

Name and Affiliation (Inspector): NA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 37.66 ft Casing Volume: 1.99 gallons

Height of Water Column: 12.02 ft Cal. 3 Volumes: 3.98 gallons

Pump Intake: 47 ft

Purge Information

Date Purged: 1/23/18 Start: 1025 Finish: 1220 Purge Rate: 100 ml/m

Purging Method: SS SUB PUMP Total Volume Purged: 11500 (gallons/mls)

Sampling Information

Date Collected: 1/23/18 Time Collected: 1225 (am/pm)

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 19.8 Time: 1225 Turbidity (ntu): 9.7 Time: 1225

Diss Oxy (mg/L): 1.7 Time: 1225 Fe 2+ mg/L: ND Time: 1225

Specific Cond. (uS): 1760 Time: 1225 Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 7.2 Time: 1225 Odor: ND Time: 1225

ReDox (mV): 62.4 Time: 1225 Appearance: CLEAR Time: 1225

ReDox (EH value):YSI ProPlus +200mV 262.4 Other: — Time: —

General/Weather Observations: _____

(sunny/cloudy/rainy) Temp. 65 (°F) Wind 15-20 (mph)

Sampler Signature: Jane Alt Date: 1-23-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1030	17.4	3.0	~~2408~~	7.1	187.7	92.8	500	37.80	
1035	17.6	3.0	2405	7.1	170.1	67.0	1000	37.83	
1040	17.6	2.9	2401	7.1	162	56.9	1500	37.93	
1045	17.9	2.9	2391	7.2	152	59.7	2000	39.86	
1050	18.3	3.0	2383	7.1	142.4	48.8	2500	39.86	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: CHARAH / ITOR

Location: BRICKHAVEN NC

Project: BRICKHAVEN LF CQ1

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1055	18.4	2.06	23.66	7.2	140	44.0	~~2~~ 3000	39.90	
1100	18.8	2.7	2353	7.2	136.0	44.0	3500	39.93	
1105	19.0	2.5	2336	7.2	133.9	39.6	4000	39.93	
1110	18.7	2.7	2307	7.2	127.4	30.3	4500	—	
1115	19.1	2.5	2267	7.2	122.1	23.6	5000	39.93	
1120	19.2	2.4	2262	7.2	120.3	23.1	5500	39.93	
1125	19.0	2.4	2201	7.2	118.6	21.0	6000	39.93	
1130	18.9	2.4	2139	7.2	115.3	20.0	6500	39.93	
1135	18.7	2.3	2116	7.2	112.7	16.3	7000	39.93	
1140	19.0	2.2	2054	7.2	107.2	15.6	7500	39.93	
1145	18.9	2.1	2022	7.2	101.0	16.6	8000	39.93	
1150	18.8	2.1	1989	7.2	97.5	14.8	6500	39.93	
1155	18.4	2.1	1942	7.2	94.1	12.6	9000	39.93	
1200	19.1	2.1	1900	7.2	89.0	10.7	9500	39.93	
1205	19.5	2.0	1861	7.2	76.3	10.6	10000	—	
1210	19.7	1.9	1843	7.2	73.0	10.5	10500	39.95	
1215	19.7	1.8	1797	7.2	69.4	10.5	11000	39.97	
1220	19.7	1.7	1760	7.2	65.8	9.6	11500	39.97	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH - HOR Location: BRICKHAVEN NC Project #: BRICKHAVEN 2F Q1

Name and Afiliation (Sampler(s): JFA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

Well Information

Well ID: LEACHATE

Well Diameter: _____

Total Well Depth: _____ ft

Static Water Level: _____ ft

Height of Water Column: _____ ft

Well Locked: (YES / NO)

Construction: (PVC/Steel/Stainless Steel)

Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: _____ gallons

Cal. 3 Volumes: _____ gallons

Pump Intake: _____ ft

Purge Information

Date Purged: ___/___/___ Start: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ (gallons/mls)

Sampling Information

Date Collected: 1/22/18 Time Collected: 1345 (am/pm)

Sampling Equipment Used: GRAB Instrument ID: YSI PROPLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 15.1 Time: 1345 Turbidity (ntu): 10.0 Time: 1345

Diss Oxy (mg/L): 7.5 Time: 1345 Fe 2+ mg/L: ND Time: 1745

Specific Cond. (uS): 1592 Time: 1345 Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 7.5 Time: 1345 Odor: ND Time: 1345

ReDox (mV): 159.3 Time: 1345 Appearance: CLEAR Time: 1345

ReDox (EH value):YSI ProPlus +200mV 359.3 Other: — Time: —

General/Weather Observations: _____

_____ (sunny/cloudy/rainy) Temp. 52 (°F) Wind 5-10 (mph)

Sampler Signature: Jael Avl Date: 1-22-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
~~15.1~~	~~7.5~~	1592	~~7.5~~	~~159.3~~	9.9				

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: ~~HDR~~CHARAH - HDR Location: BRICKHAVEN NC Project #: BRICKHAVEN LF 1.0

Name and Afiliation (Sampler(s): JFA - PACE ANALYTICAL

Name and Afiliation (Inspector): NA

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

Pump Intake: _____ ft

Purge Information

Date Purged: ___/___/___ Start: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ (gallons/mls)

Sampling Information

Date Collected: 1/22/18 Time Collected: 1450 (am/pm)

Sampling Equipment Used: GRAB Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 11.1 Time: 1450 Turbidity (ntu): 37.2 Time: 1450

Diss Oxy (mg/L): 8.2 Time: 1450 Fe 2+ mg/L: NO Time: 1450

Specific Cond. (uS): 382.7 Time: 1450 Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.7 Time: 1450 Odor: NO Time: 1450

ReDox (mV): 132.0 Time: 1450 Appearance: CLOUDY Time: 1450

ReDox (EH value):YSI ProPlus +200mV 332.0 Other: — Time: —

General/Weather Observations: FLOODED - GRAB 450 UP STREAM

_____ (sunny/cloudy/rainy) Temp. 62 (°F) Wind 5-10 (mph)

Sampler Signature: _____ Date: 1-22-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH - STOR Location: BRUNSWICK Project #: BRUNSWICK L.F 1Q

Name and Afiliation (Sampler(s): JFA - PACE ANALYTICAL

Name and Afiliation (Inspector): NA

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

Pump Intake: ft

Purge Information

Date Purged: / / Start : Finish: Purge Rate:

Purging Method: Total Volume Purged: (gallons/mls)

Sampling Information

Date Collected: 1 /22/ 18 Time Collected: 1255 (am/pm)

Sampling Equipment Used: GRAB Instrument ID: YSI PRO PLUS 3470

Bottle Type	Preservation	Analysis Required
		SHALLOW KIT

Field Measurements/Observations

Sample Temp (°C): 5.0 Time: 1255 Turbidity (ntu): ~~TOO~~ 259.6 Time: 1255

Diss Oxy (mg/L): 13.6 Time: 1255 Fe 2+ mg/L: ~~TOO TURBID~~ Time: —

Specific Cond. (uS): 147.6 Time: 1255 Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.7 Time: 1255 Odor: ND Time: 1255

ReDox (mV): 94.0 Time: 1255 Appearance: ~~B~~ MUD Time: 1255

ReDox (EH value):YSI ProPlus +200mV 294.0 Other: — Time: —

General/Weather Observations: TOO TURBID TO READ Fe 2+

(sunny/cloudy/rainy) Temp. 50 (°F) Wind 0-5 (mph)

Sampler Signature: Date: 1-22-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other

Well ID	Date	Time	Static Water Level (ft)	Total Depth (ft)	Notes
BG-1	1/22/2018	923	16.23	43.78	
MW-1	1/22/2018	938	62.47	75.55	
MW-2	1/22/2018	942	45.43	50.15	
MW-3	1/22/2018	947	23.03	43.6	
MW-4	1/22/2018	1000	14.97	25.74	
MW-5	1/22/2018	1005	26	46.96	
MW-6	1/22/2018	1012	8.96	27.93	
MW-7	1/22/2018	1022	16.68	17.64	Water Level Only
MW-7R	1/22/2018	1020	24.68	39.94	
MW-8	1/22/2018	1029	37.72	49.68	

Notes:

1) ft - feet

2) btoc - below top of casing

This page intentionally left blank.

B

Appendix B – Laboratory Reports, Chains of Custody, & Quality Control Data

This page intentionally left blank.

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
Charlotte, NC 28202				Address:	Regulatory Agency:
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone: (704)248-3632	Fax:	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1

State / Location: NC

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)
1	BG-1	WT	G			1/22/18	1125	13.3	10	2		5	3						3	1	1	3	1	1		
2	SW-1	WT	G			1/22/18	1255	5.0	10	2		5	3						3	1	1	3	1	1		
3	LEACHATE	WT	G			1/22/18	1345	15.1	10	2		5	3						3	1	1	3	1	1		
4	SW-2	WT	G			1/22/18	1450	11.1	10	2		5	3						3	1	1	3	1	1		
5																										
6	AMB	WT	G			1/22/18	1200		10	2		5	3						3	1	1	3	1	1		
7	EQB	WT	G			1/22/18	1630		10	2		5	3						3	1	1	3	1	1		
8																										
9																										
10																										
11																										
12																										

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jesse Allard (PACE)	1/23/18	1750				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse ALLARD

SIGNATURE of SAMPLER: Jesse Allard DATE Signed: 1-22-18

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
	Charlotte, NC 28202			Address:	
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone:	(704)248-3632 Fax:	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1

Regulatory Agency: | State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)
1	MW-8		WT			1/23/18	1225	19.8	10	2		5	3							3	1	1	3	1	1	
2	MW-7R		WT			1/23/18	1650	16.3	10	2		5	3							3	1	1	3	1	1	
3																											
4	FQB		WT			1/23/18	1600		10	2		5	3							3	1	1	3	1	1	
5	ATB		WT			1/23/18	1745		10	2		5	3							3	1	1	3	1	1	
6																											
7																											
8																											
9																											
10																											
11																											
12																				2							

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jesse Alfred (PACE)	1/23/18	2020				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Alfred

SIGNATURE of SAMPLER: Jesse Alfred DATE Signed: 1-23-18

SAMPLE CONDITIONS: TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A — Required Client Information:

Company: HDR Engineering
Address: 440 South Church Street
Charlotte, NC 28202
Email: sean.quarry@hdrinc.com
Phone: (704)248-3632 Fax
Requested Due Date:

Section B — Required Project Information:

Report To: Sean Quarry
Copy To:
Purchase Order #:
Project Name: Charrah-Brickhaven
Project #:

Section C — Invoice Information:

Attention:
Company Name:
Address:
Pace Quote:
Pace Project Manager: kevin.godwin@pacelabs.com,
Pace Profile #: 7672-1

Regulatory Agency:
State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)
1	MW-6	WT	G			1/24/18	930	14.4	10	2		5	3						3	1	1	3	1	1		
2	MW-6 DUPE	WT	G			1/24/18	930	14.4	10	2		5	3						3	1	1	3	1	1		
3	MW-4	WT	G			1/24/18	1245	16.7	10	2		5	3						3	1	1	3	1	1		
4	MW-3	WT	G			1/24/18	1525	16.3	10	2		5	3						3	1	1	3	1	1		
5																											
6	AMB	WT	G			1/24/18	1700		10	2		5	3						3	1	1	3	1	1		
7	EQB	WT	G			1/24/18	1720		10	2		5	3						3	1	1	3	1	1		
8																											
9																											
10																											
11																											
12																											

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jesse Allred PACE	1/24/18	1835				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Allred

SIGNATURE of SAMPLER: Jesse Allred

DATE Signed: 1-24-18

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 **Of** 1

Section A
Required Client Information:

Company:	HDR Engineering
Address:	440 South Church Street
	Charlotte, NC 28202
Email:	sean.quarry@hdrinc.com
Phone:	(704)248-3632 Fax:
Requested Due Date:	

Section B
Required Project Information:

Report To:	Sean Quarry
Copy To:	
Purchase Order #:	
Project Name:	Charrah-Brickhaven
Project #:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	kevin.godwin@pacelabs.com,
Pace Profile #:	7672-1

Regulatory Agency

State / Location
NC

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)
1	MW-5	WT	G			1/25/18	955	6.8	10	2		5	3							3	1	1	3	1	1	
2	MW-1	WT	G			1/25/18	1500	18.5	10	2		5	3							3	1	1	3	1	1	
3	MW-2	WT	G			1/25/18	1720	12.2	9	2		4	3							3	1	1	2	1	1	
4																										
5	AMB	WT	G			1/25/18	1130		10	2		5	3							3	1	1	3	1	1	
6	EQB	WT	G			1/25/18	1530		10	2		5	3							3	1	1	3	1	1	
7																										
8																										
9																										
10																										
11																										
12																										

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jesse Allred PACE	1-26-18	0630				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Allred

SIGNATURE of SAMPLER: Jesse Allred

DATE Signed: 1-25-18

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

February 13, 2018

Sean Quarry
HDR Engineering
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 23, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Herring
kevin.herring@pacelabs.com
1(704)875-9092
HORIZON Database Administrator

Enclosures

cc: Mike Plummer, HDR

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

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
Louisiana/NELAP Certification # LA170028
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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92370470001	**BG-1**	Water	01/22/18 11:25	01/23/18 13:05
92370470002	**SW-1**	Water	01/22/18 12:55	01/23/18 13:05
92370470003	**LEACHATE**	Water	01/22/18 13:45	01/23/18 13:05
92370470004	**SW-2**	Water	01/22/18 14:50	01/23/18 13:05
92370470005	**AMB**	Water	01/22/18 12:00	01/23/18 13:05
92370470006	**EQB**	Water	01/22/18 16:30	01/23/18 13:05

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92370470001	**BG-1**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370470002	**SW-1**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370470003	**LEACHATE**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370470004	**SW-2**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370470005	**AMB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370470006	**EQB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370470001	**BG-1**					
EPA 6010	Barium	358	ug/L	5.0	01/26/18 10:09	
EPA 6010	Calcium	31400	ug/L	100	01/26/18 10:09	
EPA 6020B	Boron	6.8	ug/L	5.0	02/05/18 08:43	
EPA 6020B	Lithium	17.8	ug/L	0.50	02/02/18 14:24	
EPA 903.1	Radium-226	0.357 ± 0.352 (0.536) C:NA T:94%	pCi/L		02/09/18 18:45	
EPA 904.0	Radium-228	1.14 ± 0.506 (0.858) C:80% T:80%	pCi/L		02/07/18 11:37	
SM 2540C	Total Dissolved Solids	662	mg/L	50.0	01/25/18 14:01	
EPA 300.0	Chloride	271	mg/L	6.0	01/25/18 05:02	
EPA 300.0	Fluoride	0.14	mg/L	0.10	01/24/18 14:17	
EPA 300.0	Sulfate	19.5	mg/L	1.0	01/24/18 14:17	
92370470002	**SW-1**					
EPA 6010	Barium	168	ug/L	5.0	01/26/18 10:12	
EPA 6010	Calcium	7630	ug/L	100	01/26/18 10:12	
EPA 6010	Copper	6.4	ug/L	5.0	01/26/18 10:12	
EPA 6010	Lead	8.7	ug/L	5.0	01/26/18 10:12	
EPA 6010	Vanadium	14.6	ug/L	5.0	01/26/18 10:12	
EPA 6010	Zinc	24.7	ug/L	10.0	01/26/18 10:12	
EPA 6020B	Boron	12.0	ug/L	5.0	02/05/18 08:34	
EPA 6020B	Lithium	3.5	ug/L	0.50	02/05/18 08:34	
EPA 903.1	Radium-226	-0.059 ± 0.418 (0.888) C:NA T:71%	pCi/L		02/09/18 18:45	
EPA 904.0	Radium-228	0.797 ± 0.811 (1.69) C:84% T:41%	pCi/L		02/07/18 11:46	
SM 2540C	Total Dissolved Solids	334	mg/L	25.0	01/25/18 14:01	
EPA 300.0	Chloride	16.6	mg/L	1.0	01/24/18 14:33	
EPA 300.0	Fluoride	0.20	mg/L	0.10	01/24/18 14:33	
EPA 300.0	Sulfate	32.1	mg/L	1.0	01/24/18 14:33	
92370470003	**LEACHATE**					
EPA 6010	Arsenic	18.7	ug/L	10.0	01/26/18 10:37	
EPA 6010	Barium	92.3	ug/L	5.0	01/26/18 10:37	
EPA 6010	Calcium	272000	ug/L	1000	01/26/18 10:15	
EPA 6010	Cobalt	9.2	ug/L	5.0	01/26/18 10:37	
EPA 6010	Copper	5.2	ug/L	5.0	01/26/18 10:37	
EPA 6010	Molybdenum	261	ug/L	5.0	01/26/18 10:37	
EPA 6010	Nickel	22.9	ug/L	5.0	01/26/18 10:37	
EPA 6010	Vanadium	14.9	ug/L	5.0	01/26/18 10:37	
EPA 6010	Zinc	30.8	ug/L	10.0	01/26/18 10:37	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370470003	**LEACHATE**					
EPA 6020B	Boron	2350	ug/L	100	02/05/18 08:39	
EPA 6020B	Lithium	48.0	ug/L	0.50	02/02/18 14:19	
EPA 6020B	Thallium	0.77	ug/L	0.10	02/02/18 14:19	
EPA 903.1	Radium-226	0.238 ± 0.363 (0.625) C:NA T:91%	pCi/L		02/09/18 18:45	
EPA 904.0	Radium-228	1.06 ± 0.485 (0.854) C:94% T:78%	pCi/L		02/07/18 11:43	
SM 2540C	Total Dissolved Solids	1280	mg/L	125	01/25/18 14:01	
EPA 300.0	Chloride	19.2	mg/L	1.0	01/24/18 14:49	
EPA 300.0	Fluoride	0.20	mg/L	0.10	01/24/18 14:49	
EPA 300.0	Sulfate	575	mg/L	11.0	01/25/18 05:18	
92370470004	**SW-2**					
EPA 6010	Barium	127	ug/L	5.0	01/26/18 10:24	
EPA 6010	Calcium	16200	ug/L	100	01/26/18 10:24	
EPA 6020B	Boron	14.2	ug/L	5.0	02/05/18 09:35	
EPA 6020B	Lithium	0.71	ug/L	0.50	02/05/18 09:35	
EPA 903.1	Radium-226	0.302 ± 0.517 (0.906) C:NA T:72%	pCi/L		02/09/18 18:45	
EPA 904.0	Radium-228	2.26 ± 1.64 (3.22) C:65% T:24%	pCi/L		02/07/18 11:43	
SM 2540C	Total Dissolved Solids	258	mg/L	25.0	01/25/18 14:01	
EPA 300.0	Chloride	93.1	mg/L	1.0	01/24/18 15:05	
EPA 300.0	Fluoride	0.12	mg/L	0.10	01/24/18 15:05	
EPA 300.0	Sulfate	18.0	mg/L	1.0	01/24/18 15:05	
92370470005	**AMB**					
EPA 903.1	Radium-226	0.324 ± 0.243 (0.125) C:NA T:91%	pCi/L		02/09/18 18:45	
EPA 904.0	Radium-228	0.588 ± 0.438 (0.874) C:80% T:82%	pCi/L		02/07/18 11:43	
92370470006	**EQB**					
EPA 903.1	Radium-226	0.0480 ± 0.365 (0.721) C:NA T:93%	pCi/L		02/09/18 19:00	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370470006	**EQB**					
EPA 904.0	Radium-228	0.521 ± 0.385 (0.764) C:82% T:90%	pCi/L		02/07/18 11:43	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: BG-1 **Lab ID: 92370470001** Collected: 01/22/18 11:25 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:09	7440-38-2	
Barium	**358**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:09	7440-43-9	
Calcium	**31400**	ug/L	100	1	01/24/18 06:30	01/26/18 10:09	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-48-4	
Copper	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-50-8	
Lead	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:09	7782-49-2	
Silver	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:09	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:09	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.8**	ug/L	5.0	1	01/31/18 10:37	02/05/18 08:43	7440-42-8	
Lithium	**17.8**	ug/L	0.50	1	01/31/18 10:37	02/02/18 14:24	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/02/18 14:24	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/18 14:25	01/25/18 14:00	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/26/18 22:59	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/26/18 22:59	107-13-1	
Benzene	ND	ug/L	1.0	1		01/26/18 22:59	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/26/18 22:59	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/26/18 22:59	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/26/18 22:59	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/26/18 22:59	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/26/18 22:59	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/26/18 22:59	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/26/18 22:59	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/26/18 22:59	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/26/18 22:59	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/26/18 22:59	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/26/18 22:59	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/26/18 22:59	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/26/18 22:59	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/26/18 22:59	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/26/18 22:59	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/26/18 22:59	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/26/18 22:59	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: BG-1 **Lab ID: 92370470001** Collected: 01/22/18 11:25 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/26/18 22:59	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/26/18 22:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/26/18 22:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/26/18 22:59	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/26/18 22:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/26/18 22:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/26/18 22:59	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/26/18 22:59	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/26/18 22:59	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/26/18 22:59	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/26/18 22:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/26/18 22:59	108-10-1	
Styrene	ND	ug/L	1.0	1		01/26/18 22:59	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/18 22:59	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/18 22:59	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/26/18 22:59	127-18-4	
Toluene	ND	ug/L	1.0	1		01/26/18 22:59	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/26/18 22:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/26/18 22:59	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/26/18 22:59	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/26/18 22:59	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/26/18 22:59	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/26/18 22:59	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/26/18 22:59	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/26/18 22:59	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/26/18 22:59	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	70-130	1		01/26/18 22:59	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/26/18 22:59	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**662**	mg/L	50.0	1		01/25/18 14:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**271**	mg/L	6.0	6		01/25/18 05:02	16887-00-6	
Fluoride	**0.14**	mg/L	0.10	1		01/24/18 14:17	16984-48-8	
Sulfate	**19.5**	mg/L	1.0	1		01/24/18 14:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: SW-1 **Lab ID: 92370470002** Collected: 01/22/18 12:55 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:12	7440-38-2	
Barium	**168**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:12	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:12	7440-43-9	
Calcium	**7630**	ug/L	100	1	01/24/18 06:30	01/26/18 10:12	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-48-4	
Copper	**6.4**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-50-8	
Lead	**8.7**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:12	7782-49-2	
Silver	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-22-4	
Vanadium	**14.6**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:12	7440-62-2	
Zinc	**24.7**	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:12	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**12.0**	ug/L	5.0	1	01/31/18 10:37	02/05/18 08:34	7440-42-8	
Lithium	**3.5**	ug/L	0.50	1	01/31/18 10:37	02/05/18 08:34	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 08:34	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/18 14:25	01/25/18 14:07	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/26/18 23:16	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/26/18 23:16	107-13-1	
Benzene	ND	ug/L	1.0	1		01/26/18 23:16	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/26/18 23:16	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/26/18 23:16	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/26/18 23:16	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/26/18 23:16	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/26/18 23:16	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/26/18 23:16	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/26/18 23:16	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/26/18 23:16	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/26/18 23:16	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/26/18 23:16	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/26/18 23:16	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/26/18 23:16	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/26/18 23:16	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/26/18 23:16	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/26/18 23:16	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/26/18 23:16	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/26/18 23:16	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: SW-1 **Lab ID: 92370470002** Collected: 01/22/18 12:55 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/26/18 23:16	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/26/18 23:16	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/26/18 23:16	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/26/18 23:16	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/26/18 23:16	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/26/18 23:16	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/26/18 23:16	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/26/18 23:16	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/26/18 23:16	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/26/18 23:16	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/26/18 23:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/26/18 23:16	108-10-1	
Styrene	ND	ug/L	1.0	1		01/26/18 23:16	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/18 23:16	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/18 23:16	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/26/18 23:16	127-18-4	
Toluene	ND	ug/L	1.0	1		01/26/18 23:16	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/26/18 23:16	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/26/18 23:16	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/26/18 23:16	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/26/18 23:16	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/26/18 23:16	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/26/18 23:16	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/26/18 23:16	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/26/18 23:16	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/26/18 23:16	460-00-4	
1,2-Dichloroethane-d4 (S)	94	%	70-130	1		01/26/18 23:16	17060-07-0	
Toluene-d8 (S)	110	%	70-130	1		01/26/18 23:16	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**334**	mg/L	25.0	1		01/25/18 14:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**16.6**	mg/L	1.0	1		01/24/18 14:33	16887-00-6	
Fluoride	**0.20**	mg/L	0.10	1		01/24/18 14:33	16984-48-8	
Sulfate	**32.1**	mg/L	1.0	1		01/24/18 14:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: LEACHATE **Lab ID: 92370470003** Collected: 01/22/18 13:45 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-36-0	
Arsenic	**18.7**	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:37	7440-38-2	
Barium	**92.3**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:37	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:37	7440-43-9	
Calcium	**272000**	ug/L	1000	10	01/24/18 06:30	01/26/18 10:15	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-47-3	
Cobalt	**9.2**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-48-4	
Copper	**5.2**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-50-8	
Lead	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7439-92-1	
Molybdenum	**261**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7439-98-7	
Nickel	**22.9**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:37	7782-49-2	
Silver	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-22-4	
Vanadium	**14.9**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:37	7440-62-2	
Zinc	**30.8**	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:37	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**2350**	ug/L	100	20	01/31/18 10:37	02/05/18 08:39	7440-42-8	
Lithium	**48.0**	ug/L	0.50	1	01/31/18 10:37	02/02/18 14:19	7439-93-2	
Thallium	**0.77**	ug/L	0.10	1	01/31/18 10:37	02/02/18 14:19	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/18 14:25	01/25/18 14:10	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/26/18 23:50	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/26/18 23:50	107-13-1	
Benzene	ND	ug/L	1.0	1		01/26/18 23:50	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/26/18 23:50	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/26/18 23:50	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/26/18 23:50	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/26/18 23:50	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/26/18 23:50	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/26/18 23:50	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/26/18 23:50	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/26/18 23:50	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/26/18 23:50	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/26/18 23:50	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/26/18 23:50	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/26/18 23:50	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/26/18 23:50	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/26/18 23:50	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/26/18 23:50	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/26/18 23:50	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/26/18 23:50	75-34-3	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: LEACHATE **Lab ID: 92370470003** Collected: 01/22/18 13:45 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/26/18 23:50	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/26/18 23:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/26/18 23:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/26/18 23:50	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/26/18 23:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/26/18 23:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/26/18 23:50	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/26/18 23:50	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/26/18 23:50	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/26/18 23:50	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/26/18 23:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/26/18 23:50	108-10-1	
Styrene	ND	ug/L	1.0	1		01/26/18 23:50	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/18 23:50	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/26/18 23:50	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/26/18 23:50	127-18-4	
Toluene	ND	ug/L	1.0	1		01/26/18 23:50	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/26/18 23:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/26/18 23:50	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/26/18 23:50	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/26/18 23:50	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/26/18 23:50	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/26/18 23:50	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/26/18 23:50	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/26/18 23:50	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		01/26/18 23:50	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		01/26/18 23:50	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/26/18 23:50	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1280**	mg/L	125	1		01/25/18 14:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**19.2**	mg/L	1.0	1		01/24/18 14:49	16887-00-6	
Fluoride	**0.20**	mg/L	0.10	1		01/24/18 14:49	16984-48-8	
Sulfate	**575**	mg/L	11.0	11		01/25/18 05:18	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: SW-2 **Lab ID: 92370470004** Collected: 01/22/18 14:50 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:24	7440-38-2	
Barium	**127**	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:24	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:24	7440-43-9	
Calcium	**16200**	ug/L	100	1	01/24/18 06:30	01/26/18 10:24	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-48-4	
Copper	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-50-8	
Lead	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:24	7782-49-2	
Silver	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:24	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:24	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**14.2**	ug/L	5.0	1	01/31/18 10:37	02/05/18 09:35	7440-42-8	
Lithium	**0.71**	ug/L	0.50	1	01/31/18 10:37	02/05/18 09:35	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 09:35	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/18 14:25	01/25/18 14:12	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 00:07	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 00:07	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 00:07	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 00:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 00:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 00:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 00:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 00:07	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 00:07	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 00:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 00:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 00:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 00:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 00:07	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 00:07	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 00:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:07	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:07	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 00:07	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:07	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: SW-2 **Lab ID: 92370470004** Collected: 01/22/18 14:50 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 00:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:07	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 00:07	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 00:07	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 00:07	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 00:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 00:07	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 00:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 00:07	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 00:07	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 00:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 00:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 00:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 00:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 00:07	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 00:07	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		01/27/18 00:07	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/27/18 00:07	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		01/27/18 00:07	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**258**	mg/L	25.0	1		01/25/18 14:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**93.1**	mg/L	1.0	1		01/24/18 15:05	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		01/24/18 15:05	16984-48-8	
Sulfate	**18.0**	mg/L	1.0	1		01/24/18 15:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: AMB **Lab ID: 92370470005** Collected: 01/22/18 12:00 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:27	7440-38-2	
Barium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:27	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:27	7440-43-9	
Calcium	ND	ug/L	100	1	01/24/18 06:30	01/26/18 10:27	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-48-4	
Copper	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-50-8	
Lead	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:27	7782-49-2	
Silver	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:27	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:27	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 10:37	02/05/18 09:39	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 10:37	02/05/18 09:39	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 09:39	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/18 14:25	01/25/18 14:25	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 00:23	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 00:23	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 00:23	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 00:23	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 00:23	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 00:23	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 00:23	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 00:23	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 00:23	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 00:23	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 00:23	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 00:23	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 00:23	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 00:23	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 00:23	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 00:23	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:23	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:23	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 00:23	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:23	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: AMB **Lab ID: 92370470005** Collected: 01/22/18 12:00 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:23	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:23	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:23	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:23	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 00:23	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:23	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:23	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 00:23	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 00:23	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 00:23	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 00:23	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 00:23	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 00:23	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:23	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:23	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 00:23	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 00:23	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:23	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:23	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 00:23	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 00:23	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 00:23	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 00:23	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 00:23	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 00:23	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 00:23	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		01/27/18 00:23	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		01/27/18 00:23	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/25/18 14:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/24/18 16:09	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/24/18 16:09	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/24/18 16:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: EQB **Lab ID: 92370470006** Collected: 01/22/18 16:30 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:30	7440-38-2	
Barium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:30	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/24/18 06:30	01/26/18 10:30	7440-43-9	
Calcium	ND	ug/L	100	1	01/24/18 06:30	01/26/18 10:30	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-48-4	
Copper	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-50-8	
Lead	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:30	7782-49-2	
Silver	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/24/18 06:30	01/26/18 10:30	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/24/18 06:30	01/26/18 10:30	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 10:37	02/05/18 09:43	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 10:37	02/05/18 09:43	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 09:43	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/18 14:25	01/25/18 14:28	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 00:40	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 00:40	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 00:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 00:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 00:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 00:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 00:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 00:40	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 00:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 00:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 00:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 00:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 00:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 00:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 00:40	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 00:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 00:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:40	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: EQB **Lab ID: 92370470006** Collected: 01/22/18 16:30 Received: 01/23/18 13:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 00:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 00:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 00:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 00:40	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 00:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 00:40	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 00:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 00:40	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 00:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 00:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 00:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 00:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 00:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 00:40	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 00:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		01/27/18 00:40	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	70-130	1		01/27/18 00:40	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/27/18 00:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/25/18 14:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/24/18 16:25	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/24/18 16:25	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/24/18 16:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 395302 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 2191276 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	01/25/18 13:55	

LABORATORY CONTROL SAMPLE: 2191277

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.7	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2191278 2191279

Parameter	Units	92370470001 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	2.6	95	98	75-125	3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 395232 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 2191033 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/26/18 08:19	
Arsenic	ug/L	ND	10.0	01/26/18 08:19	
Barium	ug/L	ND	5.0	01/26/18 08:19	
Beryllium	ug/L	ND	1.0	01/26/18 08:19	
Cadmium	ug/L	ND	1.0	01/26/18 08:19	
Calcium	ug/L	ND	100	01/26/18 08:19	
Chromium	ug/L	ND	5.0	01/26/18 08:19	
Cobalt	ug/L	ND	5.0	01/26/18 08:19	
Copper	ug/L	ND	5.0	01/26/18 08:19	
Lead	ug/L	ND	5.0	01/26/18 08:19	
Molybdenum	ug/L	ND	5.0	01/26/18 08:19	
Nickel	ug/L	ND	5.0	01/26/18 08:19	
Selenium	ug/L	ND	10.0	01/26/18 08:19	
Silver	ug/L	ND	5.0	01/26/18 08:19	
Vanadium	ug/L	ND	5.0	01/26/18 08:19	
Zinc	ug/L	ND	10.0	01/26/18 08:19	

LABORATORY CONTROL SAMPLE: 2191034

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	506	101	80-120	
Arsenic	ug/L	500	497	99	80-120	
Barium	ug/L	500	474	95	80-120	
Beryllium	ug/L	500	503	101	80-120	
Cadmium	ug/L	500	496	99	80-120	
Calcium	ug/L	5000	4780	96	80-120	
Chromium	ug/L	500	488	98	80-120	
Cobalt	ug/L	500	496	99	80-120	
Copper	ug/L	500	503	101	80-120	
Lead	ug/L	500	490	98	80-120	
Molybdenum	ug/L	500	508	102	80-120	
Nickel	ug/L	500	484	97	80-120	
Selenium	ug/L	500	496	99	80-120	
Silver	ug/L	250	246	99	80-120	
Vanadium	ug/L	500	482	96	80-120	
Zinc	ug/L	500	487	97	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2191035 2191036

Parameter	Units	92370360001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<3.9	500	500	493	465	99	93	75-125	6	20	
Arsenic	ug/L	<5.0	500	500	483	459	96	91	75-125	5	20	
Barium	ug/L	83.4	500	500	571	544	98	92	75-125	5	20	
Beryllium	ug/L	<0.50	500	500	530	503	106	101	75-125	5	20	
Cadmium	ug/L	<0.50	500	500	466	441	93	88	75-125	6	20	
Calcium	ug/L	12000	5000	5000	17400	16400	108	87	75-125	6	20	
Chromium	ug/L	4.9J	500	500	501	472	99	93	75-125	6	20	
Cobalt	ug/L	17.0	500	500	482	458	93	88	75-125	5	20	
Copper	ug/L	<2.5	500	500	520	498	104	99	75-125	4	20	
Lead	ug/L	3.9J	500	500	460	438	91	87	75-125	5	20	
Molybdenum	ug/L	<2.5	500	500	475	448	95	90	75-125	6	20	
Nickel	ug/L	3.2J	500	500	451	426	90	85	75-125	6	20	
Selenium	ug/L	<5.0	500	500	485	466	97	93	75-125	4	20	
Silver	ug/L	<2.5	250	250	262	250	104	100	75-125	5	20	
Vanadium	ug/L	<2.5	500	500	506	482	101	96	75-125	5	20	
Zinc	ug/L	<5.0	500	500	471	450	93	89	75-125	5	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 520509 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 2826367 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/05/18 08:30	
Lithium	ug/L	ND	0.50	02/02/18 14:10	
Thallium	ug/L	ND	0.10	02/02/18 14:10	

LABORATORY CONTROL SAMPLE: 2826368

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	106	106	80-120	
Lithium	ug/L	100	102	102	80-120	
Thallium	ug/L	100	97.0	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2826369 2826370

Parameter	Units	92370470001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6.8	100	100	106	109	100	103	75-125	3	20	
Lithium	ug/L	17.8	100	100	120	119	102	101	75-125	1	20	
Thallium	ug/L	ND	100	100	99.1	97.7	99	98	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 395724 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
2-Butanone (MEK)	ug/L	ND	5.0	01/26/18 22:26	
2-Hexanone	ug/L	ND	5.0	01/26/18 22:26	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/26/18 22:26	
Acetone	ug/L	ND	25.0	01/26/18 22:26	
Acrylonitrile	ug/L	ND	10.0	01/26/18 22:26	
Benzene	ug/L	ND	1.0	01/26/18 22:26	
Bromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromodichloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromoform	ug/L	ND	1.0	01/26/18 22:26	
Bromomethane	ug/L	ND	2.0	01/26/18 22:26	
Carbon disulfide	ug/L	ND	2.0	01/26/18 22:26	
Carbon tetrachloride	ug/L	ND	1.0	01/26/18 22:26	
Chlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
Chloroethane	ug/L	ND	1.0	01/26/18 22:26	
Chloroform	ug/L	ND	1.0	01/26/18 22:26	
Chloromethane	ug/L	ND	1.0	01/26/18 22:26	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
Dibromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Dibromomethane	ug/L	ND	1.0	01/26/18 22:26	
Ethylbenzene	ug/L	ND	1.0	01/26/18 22:26	
Iodomethane	ug/L	ND	5.0	01/26/18 22:26	
Methylene Chloride	ug/L	ND	1.0	01/26/18 22:26	
Styrene	ug/L	ND	1.0	01/26/18 22:26	
Tetrachloroethene	ug/L	ND	1.0	01/26/18 22:26	
Toluene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/26/18 22:26	
Trichloroethene	ug/L	ND	1.0	01/26/18 22:26	

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/26/18 22:26	
Vinyl acetate	ug/L	ND	2.0	01/26/18 22:26	
Vinyl chloride	ug/L	ND	1.0	01/26/18 22:26	
Xylene (Total)	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane-d4 (S)	%	98	70-130	01/26/18 22:26	
4-Bromofluorobenzene (S)	%	97	70-130	01/26/18 22:26	
Toluene-d8 (S)	%	106	70-130	01/26/18 22:26	

LABORATORY CONTROL SAMPLE: 2193798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.2	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.6	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.2	102	79-124	
1,1,2-Trichloroethane	ug/L	50	51.4	103	85-125	
1,1-Dichloroethane	ug/L	50	49.3	99	73-126	
1,1-Dichloroethene	ug/L	50	53.1	106	66-135	
1,2,3-Trichloropropane	ug/L	50	52.5	105	75-130	
1,2-Dichlorobenzene	ug/L	50	48.9	98	80-133	
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	52.8	106	75-132	
1,4-Dichlorobenzene	ug/L	50	49.7	99	78-130	
2-Butanone (MEK)	ug/L	100	104	104	61-144	
2-Hexanone	ug/L	100	102	102	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	109	109	72-135	
Acetone	ug/L	100	115	115	48-146	
Acrylonitrile	ug/L	250	272	109	40-160	
Benzene	ug/L	50	51.7	103	80-125	
Bromochloromethane	ug/L	50	47.0	94	71-125	
Bromodichloromethane	ug/L	50	46.9	94	78-124	
Bromoform	ug/L	50	49.1	98	71-128	
Bromomethane	ug/L	50	43.9	88	40-160	
Carbon disulfide	ug/L	50	56.5	113	50-160	
Carbon tetrachloride	ug/L	50	44.4	89	69-131	
Chlorobenzene	ug/L	50	49.9	100	81-122	
Chloroethane	ug/L	50	53.6	107	39-148	
Chloroform	ug/L	50	44.9	90	73-127	
Chloromethane	ug/L	50	46.1	92	44-146	
cis-1,2-Dichloroethene	ug/L	50	49.8	100	74-124	
cis-1,3-Dichloropropene	ug/L	50	53.5	107	72-132	
Dibromochloromethane	ug/L	50	50.1	100	78-125	
Dibromomethane	ug/L	50	45.4	91	82-120	
Ethylbenzene	ug/L	50	49.8	100	79-121	
Iodomethane	ug/L	100	103	103	39-154	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

LABORATORY CONTROL SAMPLE: 2193798

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	50.6	101	84-126	
Tetrachloroethene	ug/L	50	49.2	98	78-122	
Toluene	ug/L	50	49.5	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	51.8	104	71-127	
trans-1,3-Dichloropropene	ug/L	50	51.4	103	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	47.5	95	40-160	
Trichloroethene	ug/L	50	52.2	104	78-122	
Trichlorofluoromethane	ug/L	50	42.1	84	53-137	
Vinyl acetate	ug/L	100	95.9	96	40-160	
Vinyl chloride	ug/L	50	55.4	111	58-137	
Xylene (Total)	ug/L	150	152	101	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.3	97	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.2	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.5	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	24.4	122	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.0	130	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.5	107	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.1	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.1	105	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.5	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.3	101	70-130	
2-Hexanone	ug/L	ND	40	38.3	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.7	99	70-130	
Acetone	ug/L	ND	40	46.1	115	70-130	
Acrylonitrile	ug/L	ND	100	123	123	70-130	
Benzene	ug/L	ND	20	23.1	116	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	18.3	91	70-130	
Bromomethane	ug/L	ND	20	19.6	98	70-130	
Carbon disulfide	ug/L	ND	20	24.1	121	70-130	
Carbon tetrachloride	ug/L	ND	20	21.3	106	70-130	
Chlorobenzene	ug/L	ND	20	21.6	108	70-146	
Chloroethane	ug/L	ND	20	24.5	122	70-130	
Chloroform	ug/L	ND	20	21.0	105	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	23.2	115	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.7	118	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.4	102	70-130	
Dibromochloromethane	ug/L	ND	20	19.8	99	70-130	
Dibromomethane	ug/L	ND	20	19.5	97	70-130	
Ethylbenzene	ug/L	ND	20	22.4	112	70-130	
Iodomethane	ug/L	ND	40	48.7	122	70-130	
Methylene Chloride	ug/L	ND	20	23.3	117	70-130	
Styrene	ug/L	ND	20	21.5	108	70-130	
Tetrachloroethene	ug/L	ND	20	21.6	108	70-130	
Toluene	ug/L	ND	20	21.7	108	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	24.4	122	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.8	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.7	84	70-130	
Trichloroethene	ug/L	ND	20	23.2	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.3	112	70-130	
Vinyl acetate	ug/L	ND	40	31.7	79	70-130	
Vinyl chloride	ug/L	ND	20	26.1	130	70-130	
Xylene (Total)	ug/L	ND	60	67.0	112	70-130	
1,2-Dichloroethane-d4 (S)	%				99	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 Result	Dup Result	RPD	Max RPD	Qualifiers
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	.18J		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)	%	94	99	5		
4-Bromofluorobenzene (S)	%	97	97	0		
Toluene-d8 (S)	%	110	105	4		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 395501 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 2192426 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/25/18 14:01	

LABORATORY CONTROL SAMPLE: 2192427

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	266	106	90-110	

SAMPLE DUPLICATE: 2192428

Parameter	Units	92370354009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	109	110	1	5	

SAMPLE DUPLICATE: 2192429

Parameter	Units	92370464001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	91.0	95.0	4	5	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 395273 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 2191134 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/24/18 12:41	
Fluoride	mg/L	ND	0.10	01/24/18 12:41	
Sulfate	mg/L	ND	1.0	01/24/18 12:41	

LABORATORY CONTROL SAMPLE: 2191135

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.4	99	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	
Sulfate	mg/L	50	50.3	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2191136 2191137

Parameter	Units	92370464001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.8	50	50	52.8	53.4	100	101	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.6	2.6	100	101	90-110	1	10	
Sulfate	mg/L	1.3	50	50	52.2	52.9	102	103	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2191138 2191139

Parameter	Units	92370506003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	41.3	50	50	90.7	91.5	99	100	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.7	2.7	106	107	90-110	1	10	
Sulfate	mg/L	147	50	50	196	197	98	100	90-110	1	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: BG-1 **Lab ID: 92370470001** Collected: 01/22/18 11:25 Received: 01/23/18 13:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.357 ± 0.352 (0.536) C:NA T:94%**	pCi/L	02/09/18 18:45	13982-63-3	
Radium-228	EPA 904.0	**1.14 ± 0.506 (0.858) C:80% T:80%**	pCi/L	02/07/18 11:37	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: SW-1 **Lab ID: 92370470002** Collected: 01/22/18 12:55 Received: 01/23/18 13:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.059 ± 0.418 (0.888) C:NA T:71%**	pCi/L	02/09/18 18:45	13982-63-3	
Radium-228	EPA 904.0	**0.797 ± 0.811 (1.69) C:84% T:41%**	pCi/L	02/07/18 11:46	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: LEACHATE **Lab ID: 92370470003** Collected: 01/22/18 13:45 Received: 01/23/18 13:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.238 ± 0.363 (0.625) C:NA T:91%**	pCi/L	02/09/18 18:45	13982-63-3	
Radium-228	EPA 904.0	**1.06 ± 0.485 (0.854) C:94% T:78%**	pCi/L	02/07/18 11:43	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: SW-2 **Lab ID: 92370470004** Collected: 01/22/18 14:50 Received: 01/23/18 13:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.302 ± 0.517 (0.906) C:NA T:72%**	pCi/L	02/09/18 18:45	13982-63-3	
Radium-228	EPA 904.0	**2.26 ± 1.64 (3.22) C:65% T:24%**	pCi/L	02/07/18 11:43	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: AMB **Lab ID: 92370470005** Collected: 01/22/18 12:00 Received: 01/23/18 13:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.324 ± 0.243 (0.125) C:NA T:91%**	pCi/L	02/09/18 18:45	13982-63-3	
Radium-228	EPA 904.0	**0.588 ± 0.438 (0.874) C:80% T:82%**	pCi/L	02/07/18 11:43	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Sample: EQB **Lab ID: 92370470006** Collected: 01/22/18 16:30 Received: 01/23/18 13:05 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0480 ± 0.365 (0.721) C:NA T:93%**	pCi/L	02/09/18 19:00	13982-63-3	
Radium-228	EPA 904.0	**0.521 ± 0.385 (0.764) C:82% T:90%**	pCi/L	02/07/18 11:43	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 286171 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 1403665 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.321 ± 0.300 (0.425) C:NA T:92%	pCi/L	02/09/18 18:45	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

QC Batch: 286168 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

METHOD BLANK: 1403660 Matrix: Water
Associated Lab Samples: 92370470001, 92370470002, 92370470003, 92370470004, 92370470005, 92370470006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.457 ± 0.308 (0.586) C:82% T:91%	pCi/L	02/07/18 11:39	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

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.

TNTC - Too Numerous To Count

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.

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92370470001	**BG-1**	EPA 3010A	395232	EPA 6010	395248
92370470002	**SW-1**	EPA 3010A	395232	EPA 6010	395248
92370470003	**LEACHATE**	EPA 3010A	395232	EPA 6010	395248
92370470004	**SW-2**	EPA 3010A	395232	EPA 6010	395248
92370470005	**AMB**	EPA 3010A	395232	EPA 6010	395248
92370470006	**EQB**	EPA 3010A	395232	EPA 6010	395248
92370470001	**BG-1**	EPA 3020	520509	EPA 6020B	520912
92370470002	**SW-1**	EPA 3020	520509	EPA 6020B	520912
92370470003	**LEACHATE**	EPA 3020	520509	EPA 6020B	520912
92370470004	**SW-2**	EPA 3020	520509	EPA 6020B	520912
92370470005	**AMB**	EPA 3020	520509	EPA 6020B	520912
92370470006	**EQB**	EPA 3020	520509	EPA 6020B	520912
92370470001	**BG-1**	EPA 7470	395302	EPA 7470	395409
92370470002	**SW-1**	EPA 7470	395302	EPA 7470	395409
92370470003	**LEACHATE**	EPA 7470	395302	EPA 7470	395409
92370470004	**SW-2**	EPA 7470	395302	EPA 7470	395409
92370470005	**AMB**	EPA 7470	395302	EPA 7470	395409
92370470006	**EQB**	EPA 7470	395302	EPA 7470	395409
92370470001	**BG-1**	EPA 8260	395724		
92370470002	**SW-1**	EPA 8260	395724		
92370470003	**LEACHATE**	EPA 8260	395724		
92370470004	**SW-2**	EPA 8260	395724		
92370470005	**AMB**	EPA 8260	395724		
92370470006	**EQB**	EPA 8260	395724		
92370470001	**BG-1**	EPA 903.1	286171		
92370470002	**SW-1**	EPA 903.1	286171		
92370470003	**LEACHATE**	EPA 903.1	286171		
92370470004	**SW-2**	EPA 903.1	286171		
92370470005	**AMB**	EPA 903.1	286171		
92370470006	**EQB**	EPA 903.1	286171		
92370470001	**BG-1**	EPA 904.0	286168		
92370470002	**SW-1**	EPA 904.0	286168		
92370470003	**LEACHATE**	EPA 904.0	286168		
92370470004	**SW-2**	EPA 904.0	286168		
92370470005	**AMB**	EPA 904.0	286168		
92370470006	**EQB**	EPA 904.0	286168		
92370470001	**BG-1**	SM 2540C	395501		
92370470002	**SW-1**	SM 2540C	395501		
92370470003	**LEACHATE**	SM 2540C	395501		
92370470004	**SW-2**	SM 2540C	395501		
92370470005	**AMB**	SM 2540C	395501		
92370470006	**EQB**	SM 2540C	395501		
92370470001	**BG-1**	EPA 300.0	395273		
92370470002	**SW-1**	EPA 300.0	395273		
92370470003	**LEACHATE**	EPA 300.0	395273		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370470

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92370470004	**SW-2**	EPA 300.0	395273		
92370470005	**AMB**	EPA 300.0	395273		
92370470006	**EQB**	EPA 300.0	395273		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: August 4, 2017 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.04	Issuing Authority: Pace Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: HDR Engineering

Project #: WO# : 92370470

92370470

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: 1-23-18 SA

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☑ No ☐ N/A

Thermometer: ☐ IR Gun ID: T1704

Type of Ice: ☑ Wet ☐ Blue ☐ None

Correction Factor: **Cooler Temp Corrected (°C):** 2.6, 3.0

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☑ No	☐ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☐ Yes	☑ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Lot ID of split containers: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

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)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project # WO# : 92370470

PM: KLH1 Due Date: 01/30/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BPN 1 liter HNO3	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1		1	1			2										3									3	X			
2		1	1			2										3									3	X			
3		1	1			2										3									3	X			
4		1	1			2										3									3	X			
5																													
6		1	1			2										3									3	X			
7		1	1			2										3									3	X			
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
	Charlotte, NC 28202			Address:	
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone:	(704)248-3632 Fax	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1

Regulatory Agency: | State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	92576470
1	BG-1	WT	G			1/22/18	1125	13.3	10	2		5	3							3	1	1	3	1	1		001
2	SW-1	WT	G			1/24/18	1255	5.0	10	2		5	3							3	1	1	3	1	1		002
3	LEACHATE	WT	G			1/24/18	1345	15.1	10	2		5	3							3	1	1	3	1	1		003
4	SW-2	WT	G			1/24/18	1450	11.1	10	2		5	3							3	1	1	3	1	1		004
5																											
6	AMB	WT	G			1/24/18	1200		10	2		5	3							3	1	1	3	1	1		005
7	EQB	WT	G			1/22/18	1630		10	2		5	3							3	1	1	3	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)
	Jesse Allard (PACE)	1/22/18	1750	Pace HH	1-23-18	~~1750~~ 1305	2.6	Y	N	Y
							3.0	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse ALLARD

SIGNATURE of SAMPLER: Jesse Allard DATE Signed: 1-22-18

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

February 06, 2018

Sean Quarry
HDR Engineering
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 24, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Herring
kevin.herring@pacelabs.com
1(704)875-9092
HORIZON Database Administrator

Enclosures

cc: Mike Plummer, HDR

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

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
Louisiana/NELAP Certification # LA170028
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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92370675001	**MW-8**	Water	01/23/18 12:25	01/24/18 07:17
92370675002	**MW-7R**	Water	01/23/18 16:50	01/24/18 07:17
92370675003	**EQB**	Water	01/23/18 16:00	01/24/18 07:17
92370675004	**AMB**	Water	01/23/18 17:45	01/24/18 07:17
92370675005	**TRIP BLANK**	Water	01/23/18 00:00	01/24/18 07:17

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92370675001	**MW-8**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	KAC	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370675002	**MW-7R**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	KAC	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370675003	**EQB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	KAC	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370675004	**AMB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	KAC	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370675005	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370675001	**MW-8**					
EPA 6010	Barium	1210	ug/L	5.0	01/27/18 17:50	
EPA 6010	Calcium	100000	ug/L	500	01/29/18 11:44	
EPA 6010	Chromium	25.3	ug/L	5.0	01/27/18 17:50	
EPA 6010	Copper	10.2	ug/L	5.0	01/27/18 17:50	
EPA 6010	Nickel	13.8	ug/L	5.0	01/27/18 17:50	
EPA 6020B	Boron	10.1	ug/L	5.0	02/05/18 09:47	
EPA 6020B	Lithium	25.3	ug/L	0.50	02/05/18 09:47	
EPA 7470	Mercury	0.37	ug/L	0.20	01/30/18 14:17	
EPA 903.1	Radium-226	0.298 ± 0.352 (0.554) C:NA T:90%	pCi/L		02/05/18 19:30	
EPA 904.0	Radium-228	0.427 ± 0.371 (0.749) C:76% T:85%	pCi/L		02/02/18 11:50	
SM 2540C	Total Dissolved Solids	1020	mg/L	125	01/29/18 16:24	
EPA 300.0	Chloride	390	mg/L	8.0	01/28/18 11:38	
EPA 300.0	Sulfate	8.0	mg/L	1.0	01/27/18 20:47	
92370675002	**MW-7R**					
EPA 6010	Barium	251	ug/L	5.0	01/31/18 20:00	
EPA 6010	Calcium	89700	ug/L	100	01/31/18 20:00	M1
EPA 6010	Chromium	33.0	ug/L	5.0	01/31/18 20:00	
EPA 6010	Copper	7.1	ug/L	5.0	01/31/18 20:00	
EPA 6010	Nickel	18.0	ug/L	5.0	01/31/18 20:00	
EPA 6020B	Boron	13.8	ug/L	5.0	02/05/18 09:52	
EPA 6020B	Lithium	24.7	ug/L	0.50	02/05/18 09:52	
EPA 903.1	Radium-226	0.0579 ± 0.265 (0.538) C:NA T:96%	pCi/L		02/05/18 19:30	
EPA 904.0	Radium-228	0.393 ± 0.340 (0.682) C:78% T:87%	pCi/L		02/02/18 11:50	
SM 2540C	Total Dissolved Solids	855	mg/L	125	01/29/18 16:24	
EPA 300.0	Chloride	279	mg/L	6.0	01/28/18 11:55	
EPA 300.0	Fluoride	0.12	mg/L	0.10	01/27/18 21:04	
EPA 300.0	Sulfate	22.6	mg/L	1.0	01/27/18 21:04	
92370675003	**EQB**					
EPA 903.1	Radium-226	0.132 ± 0.448 (0.865) C:NA T:90%	pCi/L		02/05/18 19:44	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370675003	**EQB**					
EPA 904.0	Radium-228	0.128 ± 0.367 (0.824) C:83% T:73%	pCi/L		02/02/18 11:50	
92370675004	**AMB**					
EPA 903.1	Radium-226	0.314 ± 0.410 (0.676) C:NA T:91%	pCi/L		02/05/18 19:44	
EPA 904.0	Radium-228	0.108 ± 0.338 (0.761) C:78% T:85%	pCi/L		02/02/18 11:50	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: MW-8 **Lab ID: 92370675001** Collected: 01/23/18 12:25 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:50	7440-38-2	
Barium	**1210**	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/25/18 04:45	01/27/18 17:50	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/25/18 04:45	01/27/18 17:50	7440-43-9	
Calcium	**100000**	ug/L	500	5	01/25/18 04:45	01/29/18 11:44	7440-70-2	
Chromium	**25.3**	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-48-4	
Copper	**10.2**	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-50-8	
Lead	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7439-98-7	
Nickel	**13.8**	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:50	7782-49-2	
Silver	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:50	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:50	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10.1**	ug/L	5.0	1	01/31/18 10:37	02/05/18 09:47	7440-42-8	
Lithium	**25.3**	ug/L	0.50	1	01/31/18 10:37	02/05/18 09:47	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 09:47	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	**0.37**	ug/L	0.20	1	01/25/18 16:10	01/30/18 14:17	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 00:57	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 00:57	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 00:57	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 00:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 00:57	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 00:57	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 00:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 00:57	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 00:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 00:57	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 00:57	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 00:57	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 00:57	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 00:57	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 00:57	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 00:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 00:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 00:57	110-57-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: MW-8 **Lab ID: 92370675001** Collected: 01/23/18 12:25 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

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		01/27/18 00:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 00:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 00:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 00:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 00:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 00:57	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 00:57	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 00:57	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 00:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 00:57	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 00:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 00:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 00:57	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 00:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 00:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 00:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 00:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 00:57	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 00:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 00:57	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 00:57	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		01/27/18 00:57	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/27/18 00:57	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/27/18 00:57	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1020**	mg/L	125	1		01/29/18 16:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**390**	mg/L	8.0	8		01/28/18 11:38	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/27/18 20:47	16984-48-8	
Sulfate	**8.0**	mg/L	1.0	1		01/27/18 20:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: MW-7R **Lab ID: 92370675002** Collected: 01/23/18 16:50 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/30/18 03:50	01/31/18 20:00	7440-38-2	
Barium	**251**	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/30/18 03:50	01/31/18 20:00	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/30/18 03:50	01/31/18 20:00	7440-43-9	
Calcium	**89700**	ug/L	100	1	01/30/18 03:50	01/31/18 20:00	7440-70-2	M1
Chromium	**33.0**	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-48-4	
Copper	**7.1**	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-50-8	
Lead	ND	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7439-98-7	
Nickel	**18.0**	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/30/18 03:50	01/31/18 20:00	7782-49-2	
Silver	ND	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/30/18 03:50	01/31/18 20:00	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/30/18 03:50	01/31/18 20:00	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**13.8**	ug/L	5.0	1	01/31/18 10:37	02/05/18 09:52	7440-42-8	
Lithium	**24.7**	ug/L	0.50	1	01/31/18 10:37	02/05/18 09:52	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 09:52	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/25/18 16:10	01/30/18 14:19	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 01:14	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 01:14	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 01:14	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 01:14	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 01:14	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 01:14	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 01:14	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 01:14	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 01:14	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 01:14	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 01:14	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 01:14	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 01:14	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 01:14	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 01:14	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 01:14	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 01:14	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 01:14	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 01:14	110-57-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: MW-7R **Lab ID: 92370675002** Collected: 01/23/18 16:50 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

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		01/27/18 01:14	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 01:14	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:14	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:14	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:14	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 01:14	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 01:14	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 01:14	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 01:14	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 01:14	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 01:14	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 01:14	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 01:14	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 01:14	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 01:14	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 01:14	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 01:14	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 01:14	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 01:14	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 01:14	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 01:14	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 01:14	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 01:14	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 01:14	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 01:14	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 01:14	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		01/27/18 01:14	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		01/27/18 01:14	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		01/27/18 01:14	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**855**	mg/L	125	1		01/29/18 16:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**279**	mg/L	6.0	6		01/28/18 11:55	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		01/27/18 21:04	16984-48-8	
Sulfate	**22.6**	mg/L	1.0	1		01/27/18 21:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: EQB **Lab ID: 92370675003** Collected: 01/23/18 16:00 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:56	7440-38-2	
Barium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/25/18 04:45	01/27/18 17:56	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/25/18 04:45	01/27/18 17:56	7440-43-9	
Calcium	ND	ug/L	100	1	01/25/18 04:45	01/27/18 17:56	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-48-4	
Copper	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-50-8	
Lead	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:56	7782-49-2	
Silver	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:56	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:56	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 10:37	02/02/18 15:27	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 10:37	02/02/18 15:27	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/02/18 15:27	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/25/18 16:10	01/30/18 14:22	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 01:31	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 01:31	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 01:31	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 01:31	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 01:31	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 01:31	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 01:31	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 01:31	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 01:31	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 01:31	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 01:31	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 01:31	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 01:31	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 01:31	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 01:31	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 01:31	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 01:31	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 01:31	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 01:31	110-57-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: EQB **Lab ID: 92370675003** Collected: 01/23/18 16:00 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

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		01/27/18 01:31	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 01:31	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:31	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:31	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:31	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 01:31	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 01:31	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 01:31	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 01:31	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 01:31	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 01:31	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 01:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 01:31	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 01:31	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 01:31	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 01:31	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 01:31	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 01:31	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 01:31	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 01:31	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 01:31	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 01:31	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 01:31	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 01:31	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 01:31	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 01:31	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	99	%	70-130	1		01/27/18 01:31	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		01/27/18 01:31	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		01/27/18 01:31	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/29/18 16:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/27/18 21:21	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/27/18 21:21	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/27/18 21:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: AMB **Lab ID: 92370675004** Collected: 01/23/18 17:45 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:59	7440-38-2	
Barium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/25/18 04:45	01/27/18 17:59	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/25/18 04:45	01/27/18 17:59	7440-43-9	
Calcium	ND	ug/L	100	1	01/25/18 04:45	01/27/18 17:59	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-48-4	
Copper	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-50-8	
Lead	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:59	7782-49-2	
Silver	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/25/18 04:45	01/27/18 17:59	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/25/18 04:45	01/27/18 17:59	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 10:37	02/02/18 15:32	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 10:37	02/02/18 15:32	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/02/18 15:32	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/25/18 16:10	01/30/18 14:24	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 01:48	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 01:48	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 01:48	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 01:48	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 01:48	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 01:48	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 01:48	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 01:48	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 01:48	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 01:48	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 01:48	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 01:48	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 01:48	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 01:48	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 01:48	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 01:48	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 01:48	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 01:48	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 01:48	110-57-6	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: AMB **Lab ID: 92370675004** Collected: 01/23/18 17:45 Received: 01/24/18 07:17 Matrix: Water

Comments: • The sampler's name and signature were not listed on the COC.

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		01/27/18 01:48	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 01:48	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:48	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:48	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 01:48	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 01:48	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 01:48	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 01:48	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 01:48	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 01:48	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 01:48	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 01:48	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 01:48	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 01:48	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 01:48	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 01:48	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 01:48	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 01:48	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 01:48	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 01:48	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 01:48	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 01:48	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 01:48	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 01:48	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 01:48	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 01:48	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 01:48	460-00-4	
1,2-Dichloroethane-d4 (S)	92	%	70-130	1		01/27/18 01:48	17060-07-0	
Toluene-d8 (S)	109	%	70-130	1		01/27/18 01:48	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/29/18 16:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/27/18 22:11	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/27/18 22:11	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/27/18 22:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: TRIP BLANK **Lab ID: 92370675005** Collected: 01/23/18 00:00 Received: 01/24/18 07:17 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		01/27/18 02:05	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 02:05	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 02:05	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 02:05	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 02:05	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 02:05	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 02:05	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 02:05	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 02:05	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 02:05	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 02:05	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 02:05	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 02:05	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 02:05	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 02:05	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 02:05	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:05	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:05	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 02:05	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:05	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:05	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:05	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:05	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:05	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 02:05	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:05	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:05	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 02:05	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 02:05	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 02:05	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 02:05	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 02:05	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 02:05	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:05	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:05	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 02:05	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 02:05	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:05	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:05	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 02:05	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 02:05	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 02:05	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 02:05	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 02:05	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 02:05	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 02:05	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: TRIP BLANK **Lab ID: 92370675005** Collected: 01/23/18 00:00 Received: 01/24/18 07:17 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		01/27/18 02:05	17060-07-0	
Toluene-d8 (S)	107	%	70-130	1		01/27/18 02:05	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 395540 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

METHOD BLANK: 2192747 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	01/30/18 13:48	

LABORATORY CONTROL SAMPLE: 2192748

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.3	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2192749 2192750

Parameter	Units	92370443001 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	0.74	0.74	29	29	75-125	0	25	M1

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 395418 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92370675001, 92370675003, 92370675004

METHOD BLANK: 2192071 Matrix: Water
Associated Lab Samples: 92370675001, 92370675003, 92370675004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/27/18 17:09	
Arsenic	ug/L	ND	10.0	01/27/18 17:09	
Barium	ug/L	ND	5.0	01/27/18 17:09	
Beryllium	ug/L	ND	1.0	01/27/18 17:09	
Cadmium	ug/L	ND	1.0	01/27/18 17:09	
Calcium	ug/L	ND	100	01/27/18 14:14	
Chromium	ug/L	ND	5.0	01/27/18 17:09	
Cobalt	ug/L	ND	5.0	01/27/18 17:09	
Copper	ug/L	ND	5.0	01/27/18 17:09	
Lead	ug/L	ND	5.0	01/27/18 17:09	
Molybdenum	ug/L	ND	5.0	01/27/18 17:09	
Nickel	ug/L	ND	5.0	01/27/18 14:14	
Selenium	ug/L	ND	10.0	01/27/18 17:09	
Silver	ug/L	ND	5.0	01/27/18 17:09	
Vanadium	ug/L	ND	5.0	01/27/18 17:09	
Zinc	ug/L	ND	10.0	01/27/18 14:14	

LABORATORY CONTROL SAMPLE: 2192072

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	495	99	80-120	
Arsenic	ug/L	500	484	97	80-120	
Barium	ug/L	500	522	104	80-120	
Beryllium	ug/L	500	510	102	80-120	
Cadmium	ug/L	500	494	99	80-120	
Calcium	ug/L	5000	5590	112	80-120	
Chromium	ug/L	500	512	102	80-120	
Cobalt	ug/L	500	489	98	80-120	
Copper	ug/L	500	522	104	80-120	
Lead	ug/L	500	481	96	80-120	
Molybdenum	ug/L	500	511	102	80-120	
Nickel	ug/L	500	497	99	80-120	
Selenium	ug/L	500	485	97	80-120	
Silver	ug/L	250	252	101	80-120	
Vanadium	ug/L	500	500	100	80-120	
Zinc	ug/L	500	492	98	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2192073 2192074

Parameter	Units	92370552001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L		500	500	497	520	99	104	75-125	4	20	
Arsenic	ug/L		500	500	500	522	100	104	75-125	4	20	
Barium	ug/L		500	500	560	584	103	108	75-125	4	20	
Beryllium	ug/L		500	500	515	536	103	107	75-125	4	20	
Cadmium	ug/L		500	500	504	525	101	105	75-125	4	20	
Calcium	ug/L		5000	5000	50600	53400	39	96	75-125	6	20	M1
Chromium	ug/L		500	500	516	538	96	100	75-125	4	20	
Cobalt	ug/L		500	500	489	508	98	102	75-125	4	20	
Copper	ug/L	56.5	500	500	561	582	101	105	75-125	4	20	
Lead	ug/L		500	500	482	503	96	100	75-125	4	20	
Molybdenum	ug/L		500	500	514	535	102	106	75-125	4	20	
Nickel	ug/L		500	500	498	518	97	101	75-125	4	20	
Selenium	ug/L		500	500	502	522	100	104	75-125	4	20	
Silver	ug/L		250	250	254	264	101	105	75-125	4	20	
Vanadium	ug/L		500	500	510	532	102	106	75-125	4	20	
Zinc	ug/L	162	500	500	641	668	96	101	75-125	4	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 395928
QC Batch Method: EPA 3010A
Associated Lab Samples: 92370675002

Analysis Method: EPA 6010
Analysis Description: 6010 MET

METHOD BLANK: 2194836
Matrix: Water
Associated Lab Samples: 92370675002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/31/18 19:54	
Arsenic	ug/L	ND	10.0	01/31/18 19:54	
Barium	ug/L	ND	5.0	01/31/18 19:54	
Beryllium	ug/L	ND	1.0	01/31/18 19:54	
Cadmium	ug/L	ND	1.0	01/31/18 19:54	
Calcium	ug/L	ND	100	01/31/18 19:54	
Chromium	ug/L	ND	5.0	01/31/18 19:54	
Cobalt	ug/L	ND	5.0	01/31/18 19:54	
Copper	ug/L	ND	5.0	01/31/18 19:54	
Lead	ug/L	ND	5.0	01/31/18 19:54	
Molybdenum	ug/L	ND	5.0	01/31/18 19:54	
Nickel	ug/L	ND	5.0	01/31/18 19:54	
Selenium	ug/L	ND	10.0	01/31/18 19:54	
Silver	ug/L	ND	5.0	01/31/18 19:54	
Vanadium	ug/L	ND	5.0	01/31/18 19:54	
Zinc	ug/L	ND	10.0	01/31/18 19:54	

LABORATORY CONTROL SAMPLE: 2194837

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	506	101	80-120	
Arsenic	ug/L	500	494	99	80-120	
Barium	ug/L	500	508	102	80-120	
Beryllium	ug/L	500	510	102	80-120	
Cadmium	ug/L	500	502	100	80-120	
Calcium	ug/L	5000	4900	98	80-120	
Chromium	ug/L	500	496	99	80-120	
Cobalt	ug/L	500	494	99	80-120	
Copper	ug/L	500	516	103	80-120	
Lead	ug/L	500	482	96	80-120	
Molybdenum	ug/L	500	516	103	80-120	
Nickel	ug/L	500	493	99	80-120	
Selenium	ug/L	500	491	98	80-120	
Silver	ug/L	250	249	100	80-120	
Vanadium	ug/L	500	482	96	80-120	
Zinc	ug/L	500	474	95	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2194838 2194839

Parameter	Units	92370675002 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	510	516	102	103	75-125	1	20	
Arsenic	ug/L	ND	500	500	508	513	102	103	75-125	1	20	
Barium	ug/L	251	500	500	761	758	102	101	75-125	0	20	
Beryllium	ug/L	ND	500	500	510	517	102	103	75-125	1	20	
Cadmium	ug/L	ND	500	500	505	509	101	102	75-125	1	20	
Calcium	ug/L	89700	5000	5000	98100	95000	169	106	75-125	3	20	M1
Chromium	ug/L	33.0	500	500	526	529	99	99	75-125	1	20	
Cobalt	ug/L	ND	500	500	473	478	95	96	75-125	1	20	
Copper	ug/L	7.1	500	500	521	525	103	104	75-125	1	20	
Lead	ug/L	ND	500	500	462	464	92	93	75-125	0	20	
Molybdenum	ug/L	ND	500	500	517	522	103	104	75-125	1	20	
Nickel	ug/L	18.0	500	500	487	492	94	95	75-125	1	20	
Selenium	ug/L	ND	500	500	509	510	101	102	75-125	0	20	
Silver	ug/L	ND	250	250	254	255	101	102	75-125	1	20	
Vanadium	ug/L	ND	500	500	486	491	97	98	75-125	1	20	
Zinc	ug/L	ND	500	500	467	474	93	94	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 520509 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

METHOD BLANK: 2826367 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/05/18 08:30	
Lithium	ug/L	ND	0.50	02/02/18 14:10	
Thallium	ug/L	ND	0.10	02/02/18 14:10	

LABORATORY CONTROL SAMPLE: 2826368

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	106	106	80-120	
Lithium	ug/L	100	102	102	80-120	
Thallium	ug/L	100	97.0	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2826369 2826370

Parameter	Units	92370470001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6.8	100	100	106	109	100	103	75-125	3	20	
Lithium	ug/L	17.8	100	100	120	119	102	101	75-125	1	20	
Thallium	ug/L	ND	100	100	99.1	97.7	99	98	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 395724 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004, 92370675005

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004, 92370675005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
2-Butanone (MEK)	ug/L	ND	5.0	01/26/18 22:26	
2-Hexanone	ug/L	ND	5.0	01/26/18 22:26	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/26/18 22:26	
Acetone	ug/L	ND	25.0	01/26/18 22:26	
Acrylonitrile	ug/L	ND	10.0	01/26/18 22:26	
Benzene	ug/L	ND	1.0	01/26/18 22:26	
Bromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromodichloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromoform	ug/L	ND	1.0	01/26/18 22:26	
Bromomethane	ug/L	ND	2.0	01/26/18 22:26	
Carbon disulfide	ug/L	ND	2.0	01/26/18 22:26	
Carbon tetrachloride	ug/L	ND	1.0	01/26/18 22:26	
Chlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
Chloroethane	ug/L	ND	1.0	01/26/18 22:26	
Chloroform	ug/L	ND	1.0	01/26/18 22:26	
Chloromethane	ug/L	ND	1.0	01/26/18 22:26	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
Dibromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Dibromomethane	ug/L	ND	1.0	01/26/18 22:26	
Ethylbenzene	ug/L	ND	1.0	01/26/18 22:26	
Iodomethane	ug/L	ND	5.0	01/26/18 22:26	
Methylene Chloride	ug/L	ND	1.0	01/26/18 22:26	
Styrene	ug/L	ND	1.0	01/26/18 22:26	
Tetrachloroethene	ug/L	ND	1.0	01/26/18 22:26	
Toluene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/26/18 22:26	
Trichloroethene	ug/L	ND	1.0	01/26/18 22:26	

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004, 92370675005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/26/18 22:26	
Vinyl acetate	ug/L	ND	2.0	01/26/18 22:26	
Vinyl chloride	ug/L	ND	1.0	01/26/18 22:26	
Xylene (Total)	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane-d4 (S)	%	98	70-130	01/26/18 22:26	
4-Bromofluorobenzene (S)	%	97	70-130	01/26/18 22:26	
Toluene-d8 (S)	%	106	70-130	01/26/18 22:26	

LABORATORY CONTROL SAMPLE: 2193798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.2	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.6	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.2	102	79-124	
1,1,2-Trichloroethane	ug/L	50	51.4	103	85-125	
1,1-Dichloroethane	ug/L	50	49.3	99	73-126	
1,1-Dichloroethene	ug/L	50	53.1	106	66-135	
1,2,3-Trichloropropane	ug/L	50	52.5	105	75-130	
1,2-Dichlorobenzene	ug/L	50	48.9	98	80-133	
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	52.8	106	75-132	
1,4-Dichlorobenzene	ug/L	50	49.7	99	78-130	
2-Butanone (MEK)	ug/L	100	104	104	61-144	
2-Hexanone	ug/L	100	102	102	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	109	109	72-135	
Acetone	ug/L	100	115	115	48-146	
Acrylonitrile	ug/L	250	272	109	40-160	
Benzene	ug/L	50	51.7	103	80-125	
Bromochloromethane	ug/L	50	47.0	94	71-125	
Bromodichloromethane	ug/L	50	46.9	94	78-124	
Bromoform	ug/L	50	49.1	98	71-128	
Bromomethane	ug/L	50	43.9	88	40-160	
Carbon disulfide	ug/L	50	56.5	113	50-160	
Carbon tetrachloride	ug/L	50	44.4	89	69-131	
Chlorobenzene	ug/L	50	49.9	100	81-122	
Chloroethane	ug/L	50	53.6	107	39-148	
Chloroform	ug/L	50	44.9	90	73-127	
Chloromethane	ug/L	50	46.1	92	44-146	
cis-1,2-Dichloroethene	ug/L	50	49.8	100	74-124	
cis-1,3-Dichloropropene	ug/L	50	53.5	107	72-132	
Dibromochloromethane	ug/L	50	50.1	100	78-125	
Dibromomethane	ug/L	50	45.4	91	82-120	
Ethylbenzene	ug/L	50	49.8	100	79-121	
Iodomethane	ug/L	100	103	103	39-154	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

LABORATORY CONTROL SAMPLE: 2193798

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	50.6	101	84-126	
Tetrachloroethene	ug/L	50	49.2	98	78-122	
Toluene	ug/L	50	49.5	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	51.8	104	71-127	
trans-1,3-Dichloropropene	ug/L	50	51.4	103	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	47.5	95	40-160	
Trichloroethene	ug/L	50	52.2	104	78-122	
Trichlorofluoromethane	ug/L	50	42.1	84	53-137	
Vinyl acetate	ug/L	100	95.9	96	40-160	
Vinyl chloride	ug/L	50	55.4	111	58-137	
Xylene (Total)	ug/L	150	152	101	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.3	97	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.2	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.5	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	24.4	122	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.0	130	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.5	107	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.1	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.1	105	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.5	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.3	101	70-130	
2-Hexanone	ug/L	ND	40	38.3	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.7	99	70-130	
Acetone	ug/L	ND	40	46.1	115	70-130	
Acrylonitrile	ug/L	ND	100	123	123	70-130	
Benzene	ug/L	ND	20	23.1	116	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	18.3	91	70-130	
Bromomethane	ug/L	ND	20	19.6	98	70-130	
Carbon disulfide	ug/L	ND	20	24.1	121	70-130	
Carbon tetrachloride	ug/L	ND	20	21.3	106	70-130	
Chlorobenzene	ug/L	ND	20	21.6	108	70-146	
Chloroethane	ug/L	ND	20	24.5	122	70-130	
Chloroform	ug/L	ND	20	21.0	105	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	23.2	115	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.7	118	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.4	102	70-130	
Dibromochloromethane	ug/L	ND	20	19.8	99	70-130	
Dibromomethane	ug/L	ND	20	19.5	97	70-130	
Ethylbenzene	ug/L	ND	20	22.4	112	70-130	
Iodomethane	ug/L	ND	40	48.7	122	70-130	
Methylene Chloride	ug/L	ND	20	23.3	117	70-130	
Styrene	ug/L	ND	20	21.5	108	70-130	
Tetrachloroethene	ug/L	ND	20	21.6	108	70-130	
Toluene	ug/L	ND	20	21.7	108	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	24.4	122	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.8	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.7	84	70-130	
Trichloroethene	ug/L	ND	20	23.2	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.3	112	70-130	
Vinyl acetate	ug/L	ND	40	31.7	79	70-130	
Vinyl chloride	ug/L	ND	20	26.1	130	70-130	
Xylene (Total)	ug/L	ND	60	67.0	112	70-130	
1,2-Dichloroethane-d4 (S)	%				99	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 Result	Dup Result	RPD	Max RPD	Qualifiers
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	.18J		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)	%	94	99	5		
4-Bromofluorobenzene (S)	%	97	97	0		
Toluene-d8 (S)	%	110	105	4		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 395882 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

METHOD BLANK: 2194635 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/29/18 16:24	

LABORATORY CONTROL SAMPLE: 2194636

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	266	106	90-110	

SAMPLE DUPLICATE: 2194637

Parameter	Units	92370577005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	70.0	75.0	7	5	D6

SAMPLE DUPLICATE: 2194638

Parameter	Units	92370577015 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 395756 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

METHOD BLANK: 2193948 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/27/18 16:17	
Fluoride	mg/L	ND	0.10	01/27/18 16:17	
Sulfate	mg/L	ND	1.0	01/27/18 16:17	

LABORATORY CONTROL SAMPLE: 2193949

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	103	90-110	
Sulfate	mg/L	50	52.4	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2193950 2193951

Parameter	Units	92370562001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.8	50	50	54.9	55.5	100	101	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.6	2.7	105	106	90-110	1	10	
Sulfate	mg/L	6.6	50	50	58.5	59.2	104	105	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2193952 2193953

Parameter	Units	92370675003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	50	50	50.7	51.3	101	103	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.6	2.6	103	105	90-110	2	10	
Sulfate	mg/L	ND	50	50	53.0	53.8	106	108	90-110	1	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: MW-8 **Lab ID: 92370675001** Collected: 01/23/18 12:25 Received: 01/24/18 07:17 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.298 ± 0.352 (0.554) C:NA T:90%**	pCi/L	02/05/18 19:30	13982-63-3	
Radium-228	EPA 904.0	**0.427 ± 0.371 (0.749) C:76% T:85%**	pCi/L	02/02/18 11:50	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: MW-7R **Lab ID: 92370675002** Collected: 01/23/18 16:50 Received: 01/24/18 07:17 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0579 ± 0.265 (0.538) C:NA T:96%**	pCi/L	02/05/18 19:30	13982-63-3	
Radium-228	EPA 904.0	**0.393 ± 0.340 (0.682) C:78% T:87%**	pCi/L	02/02/18 11:50	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: EQB **Lab ID: 92370675003** Collected: 01/23/18 16:00 Received: 01/24/18 07:17 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.132 ± 0.448 (0.865) C:NA T:90%**	pCi/L	02/05/18 19:44	13982-63-3	
Radium-228	EPA 904.0	**0.128 ± 0.367 (0.824) C:83% T:73%**	pCi/L	02/02/18 11:50	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Sample: AMB **Lab ID: 92370675004** Collected: 01/23/18 17:45 Received: 01/24/18 07:17 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.314 ± 0.410 (0.676) C:NA T:91%**	pCi/L	02/05/18 19:44	13982-63-3	
Radium-228	EPA 904.0	**0.108 ± 0.338 (0.761) C:78% T:85%**	pCi/L	02/02/18 11:50	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 286274 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

METHOD BLANK: 1404290 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0105 ± 0.333 (0.780) C:85% T:75%	pCi/L	02/02/18 12:10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

QC Batch: 286269 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

METHOD BLANK: 1404286 Matrix: Water
Associated Lab Samples: 92370675001, 92370675002, 92370675003, 92370675004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.369 ± 0.482 (0.795) C:NA T:82%	pCi/L	02/05/18 18:47	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

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.

TNTC - Too Numerous To Count

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.

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

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.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370675

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92370675001	**MW-8**	EPA 3010A	395418	EPA 6010	395450
92370675002	**MW-7R**	EPA 3010A	395928	EPA 6010	395945
92370675003	**EQB**	EPA 3010A	395418	EPA 6010	395450
92370675004	**AMB**	EPA 3010A	395418	EPA 6010	395450
92370675001	**MW-8**	EPA 3020	520509	EPA 6020B	520912
92370675002	**MW-7R**	EPA 3020	520509	EPA 6020B	520912
92370675003	**EQB**	EPA 3020	520509	EPA 6020B	520912
92370675004	**AMB**	EPA 3020	520509	EPA 6020B	520912
92370675001	**MW-8**	EPA 7470	395540	EPA 7470	395591
92370675002	**MW-7R**	EPA 7470	395540	EPA 7470	395591
92370675003	**EQB**	EPA 7470	395540	EPA 7470	395591
92370675004	**AMB**	EPA 7470	395540	EPA 7470	395591
92370675001	**MW-8**	EPA 8260	395724		
92370675002	**MW-7R**	EPA 8260	395724		
92370675003	**EQB**	EPA 8260	395724		
92370675004	**AMB**	EPA 8260	395724		
92370675005	**TRIP BLANK**	EPA 8260	395724		
92370675001	**MW-8**	EPA 903.1	286269		
92370675002	**MW-7R**	EPA 903.1	286269		
92370675003	**EQB**	EPA 903.1	286269		
92370675004	**AMB**	EPA 903.1	286269		
92370675001	**MW-8**	EPA 904.0	286274		
92370675002	**MW-7R**	EPA 904.0	286274		
92370675003	**EQB**	EPA 904.0	286274		
92370675004	**AMB**	EPA 904.0	286274		
92370675001	**MW-8**	SM 2540C	395882		
92370675002	**MW-7R**	SM 2540C	395882		
92370675003	**EQB**	SM 2540C	395882		
92370675004	**AMB**	SM 2540C	395882		
92370675001	**MW-8**	EPA 300.0	395756		
92370675002	**MW-7R**	EPA 300.0	395756		
92370675003	**EQB**	EPA 300.0	395756		
92370675004	**AMB**	EPA 300.0	395756		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: August 4, 2017 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.04	Issuing Authority: Pace Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: HDR Engineering Project #: WO# : 92370675



Courier: ☐ Commercial ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☑ No

Date/Initials Person Examining Contents: MA 1.24

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer: ☐ IR Gun ID: T1704 ☑ Wet ☐ Blue ☐ None

Correction Factor: Cooler Temp Corrected (°C): 1.6 Type of Ice:

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☐ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

CLIENT NOTIFICATION/RESOLUTION Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: Trip Blank received not on Chain!!!

Lot ID of split containers: _____

Project Manager SCURF Review: _____ Date: _____

Project Manager SRF Review: _____ Date: _____

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)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Proje

WO# : 92370675

PM: KLH1 Due Date: 01/31/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	RADS	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1		1	1			2										3								3				
2		1	1			2										3								3				
3																													
4		1	1			2										3								3				
5		1	1			2										3								3				
6																													
7																2		Trip Blank											
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
Charlotte, NC 28202				Address:	
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone:	(704)248-3632 Fax:	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1

Regulatory Agency: | State / Location: NC

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	
1	MW-8		WT	/	/	1/23/18	1225	19.8	10	2		5	3						3	1	1	3	1	1		WM
2	MW-7R		WT	/	/	1/23/18	1650	16.3	10	2		5	3						3	1	1	3	1	1		WM
3																										
4	EQB		WT	/	/	1/23/18	1600		10	2		5	3						3	1	1	3	1	1		WM
5	AMB		WT	/	/	1/23/18	1745		10	2		5	3						3	1	1	3	1	1		WM
6																										
7																										
8																										
9																										
10																										
11																										
12																			2							WM

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jesse Allred (PACE)	1/23/18	2020		1/24/18	0717				
		1/24/18	1409	Michael Pace	1-24	1409	1.6	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Allred

SIGNATURE of SAMPLER: Jesse Allred DATE Signed: 1-23-18

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370917001	**MW-6**					
EPA 6010	Barium	106	ug/L	5.0	01/29/18 19:46	
EPA 6010	Calcium	34100	ug/L	100	01/29/18 19:46	
EPA 6020B	Boron	6.8	ug/L	5.0	02/02/18 11:03	
EPA 6020B	Lithium	53.7	ug/L	0.50	02/02/18 11:03	
EPA 7470	Mercury	0.32	ug/L	0.20	02/13/18 00:15	
EPA 903.1	Radium-226	0.0517 ± 0.268 (0.557) C:NA T:84%	pCi/L		02/10/18 18:52	
EPA 904.0	Radium-228	1.07 ± 0.603 (1.10) C:80% T:81%	pCi/L		02/06/18 19:03	
SM 2540C	Total Dissolved Solids	790	mg/L	50.0	01/31/18 09:58	
EPA 300.0	Chloride	240	mg/L	5.0	01/28/18 12:12	
EPA 300.0	Fluoride	0.52	mg/L	0.10	01/27/18 23:53	
EPA 300.0	Sulfate	126	mg/L	5.0	01/28/18 12:12	
92370917002	**MW-6 DUP**					
EPA 6010	Barium	99.5	ug/L	5.0	01/29/18 19:49	
EPA 6010	Calcium	33900	ug/L	100	01/29/18 19:49	
EPA 6020B	Boron	5.4	ug/L	5.0	02/02/18 10:55	
EPA 6020B	Lithium	41.9	ug/L	0.50	02/02/18 10:55	
EPA 903.1	Radium-226	0.278 ± 0.423 (0.728) C:NA T:84%	pCi/L		02/10/18 18:52	
EPA 904.0	Radium-228	0.874 ± 0.629 (1.22) C:74% T:78%	pCi/L		02/06/18 19:03	
SM 2540C	Total Dissolved Solids	774	mg/L	50.0	01/31/18 09:58	
EPA 300.0	Chloride	229	mg/L	5.0	01/28/18 12:28	
EPA 300.0	Fluoride	0.49	mg/L	0.10	01/28/18 00:10	
EPA 300.0	Sulfate	107	mg/L	5.0	01/28/18 12:28	
92370917003	**MW-4**					
EPA 6010	Barium	300	ug/L	5.0	01/29/18 19:52	
EPA 6010	Calcium	66700	ug/L	100	01/29/18 19:52	
EPA 6010	Chromium	5.7	ug/L	5.0	01/29/18 19:52	
EPA 6010	Nickel	6.9	ug/L	5.0	01/29/18 19:52	
EPA 6020B	Lithium	28.6	ug/L	0.50	02/02/18 10:58	
EPA 903.1	Radium-226	0.000 ± 0.277 (0.599) C:NA T:90%	pCi/L		02/10/18 18:52	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

February 13, 2018

Sean Quarry
HDR Engineering
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 25, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Bonnie Vang for
Kevin Herring
kevin.herring@pacelabs.com
1(704)875-9092
HORIZON Database Administrator

Enclosures

cc: Mike Plummer, HDR

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

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
Louisiana/NELAP Certification # LA170028
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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92370917001	**MW-6**	Water	01/24/18 09:30	01/25/18 14:35
92370917002	**MW-6 DUP**	Water	01/24/18 09:30	01/25/18 14:35
92370917003	**MW-4**	Water	01/24/18 12:45	01/25/18 14:35
92370917004	**MW-3**	Water	01/24/18 15:25	01/25/18 14:35
92370917005	**AMB**	Water	01/24/18 17:00	01/25/18 14:35
92370917006	**EQB**	Water	01/24/18 17:20	01/25/18 14:35
92370917007	**TRIP BLANK**	Water	01/24/18 00:00	01/25/18 14:35

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92370917001	**MW-6**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	TT3	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370917002	**MW-6 DUP**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	TT3	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370917003	**MW-4**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	TT3	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370917004	**MW-3**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	TT3	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370917005	**AMB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	TT3	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370917006	**EQB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	TT3	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370917007	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370917003	**MW-4**					
EPA 904.0	Radium-228	0.710 ± 0.549 (1.08) C:83% T:74%	pCi/L		02/06/18 19:03	
SM 2540C	Total Dissolved Solids	1210	mg/L	25.0	01/31/18 09:58	
EPA 300.0	Chloride	492	mg/L	11.0	01/28/18 12:45	
EPA 300.0	Fluoride	0.32	mg/L	0.10	01/28/18 00:27	
EPA 300.0	Sulfate	12.3	mg/L	1.0	01/28/18 00:27	
92370917004	**MW-3**					
EPA 6010	Antimony	5.8	ug/L	5.0	01/29/18 20:40	
EPA 6010	Barium	570	ug/L	5.0	01/29/18 20:40	
EPA 6010	Calcium	169000	ug/L	1000	01/29/18 19:56	
EPA 6010	Chromium	5.3	ug/L	5.0	01/29/18 20:40	
EPA 6010	Copper	5.6	ug/L	5.0	01/29/18 20:40	
EPA 6010	Molybdenum	6.9	ug/L	5.0	01/29/18 20:40	
EPA 6020B	Boron	16.6	ug/L	5.0	02/02/18 11:00	
EPA 6020B	Lithium	90.2	ug/L	0.50	02/02/18 11:00	
EPA 903.1	Radium-226	1.21 ± 0.567 (0.511) C:NA T:85%	pCi/L		02/10/18 19:06	
EPA 904.0	Radium-228	1.08 ± 0.411 (0.591) C:80% T:85%	pCi/L		02/06/18 12:15	
SM 2540C	Total Dissolved Solids	1060	mg/L	25.0	01/31/18 09:58	
EPA 300.0	Chloride	987	mg/L	15.0	01/28/18 13:01	
EPA 300.0	Fluoride	0.46	mg/L	0.10	01/28/18 00:43	
EPA 300.0	Sulfate	102	mg/L	15.0	01/28/18 13:01	
92370917005	**AMB**					
EPA 903.1	Radium-226	0.257 ± 0.237 (0.140) C:NA T:89%	pCi/L		02/10/18 19:06	
EPA 904.0	Radium-228	0.536 ± 0.522 (1.08) C:83% T:83%	pCi/L		02/06/18 15:30	
92370917006	**EQB**					
EPA 903.1	Radium-226	0.169 ± 0.257 (0.414) C:NA T:80%	pCi/L		02/10/18 19:06	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370917006	**EQB**					
EPA 904.0	Radium-228	0.474 ± 0.339 (0.647) C:78% T:76%	pCi/L		02/06/18 11:51	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-6 **Lab ID: 92370917001** Collected: 01/24/18 09:30 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:46	7440-38-2	
Barium	**106**	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:46	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:46	7440-43-9	
Calcium	**34100**	ug/L	100	1	01/26/18 04:40	01/29/18 19:46	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-48-4	
Copper	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-50-8	
Lead	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:46	7782-49-2	
Silver	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:46	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:46	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.8**	ug/L	5.0	1	01/31/18 09:37	02/02/18 11:03	7440-42-8	
Lithium	**53.7**	ug/L	0.50	1	01/31/18 09:37	02/02/18 11:03	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 09:37	02/02/18 11:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	**0.32**	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:15	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 02:21	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 02:21	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 02:21	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 02:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 02:21	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 02:21	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 02:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 02:21	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 02:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 02:21	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 02:21	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 02:21	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 02:21	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 02:21	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 02:21	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 02:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 02:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:21	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-6 **Lab ID: 92370917001** Collected: 01/24/18 09:30 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:21	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 02:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 02:21	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 02:21	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 02:21	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 02:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 02:21	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 02:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 02:21	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 02:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 02:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 02:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 02:21	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 02:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 02:21	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 02:21	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/27/18 02:21	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	70-130	1		01/27/18 02:21	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/27/18 02:21	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**790**	mg/L	50.0	1		01/31/18 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**240**	mg/L	5.0	5		01/28/18 12:12	16887-00-6	
Fluoride	**0.52**	mg/L	0.10	1		01/27/18 23:53	16984-48-8	
Sulfate	**126**	mg/L	5.0	5		01/28/18 12:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-6 DUP **Lab ID: 92370917002** Collected: 01/24/18 09:30 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:49	7440-38-2	
Barium	**99.5**	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:49	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:49	7440-43-9	
Calcium	**33900**	ug/L	100	1	01/26/18 04:40	01/29/18 19:49	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-48-4	
Copper	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-50-8	
Lead	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:49	7782-49-2	
Silver	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:49	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:49	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**5.4**	ug/L	5.0	1	01/31/18 09:37	02/02/18 10:55	7440-42-8	
Lithium	**41.9**	ug/L	0.50	1	01/31/18 09:37	02/02/18 10:55	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 09:37	02/02/18 10:55	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:18	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 02:38	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 02:38	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 02:38	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 02:38	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 02:38	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 02:38	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 02:38	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 02:38	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 02:38	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 02:38	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 02:38	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 02:38	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 02:38	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 02:38	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 02:38	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 02:38	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:38	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:38	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 02:38	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:38	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-6 DUP **Lab ID: 92370917002** Collected: 01/24/18 09:30 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:38	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:38	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:38	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 02:38	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:38	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:38	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 02:38	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 02:38	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 02:38	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 02:38	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 02:38	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 02:38	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:38	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:38	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 02:38	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 02:38	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:38	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:38	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 02:38	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 02:38	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 02:38	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 02:38	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 02:38	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 02:38	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		01/27/18 02:38	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		01/27/18 02:38	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		01/27/18 02:38	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**774**	mg/L	50.0	1		01/31/18 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**229**	mg/L	5.0	5		01/28/18 12:28	16887-00-6	
Fluoride	**0.49**	mg/L	0.10	1		01/28/18 00:10	16984-48-8	
Sulfate	**107**	mg/L	5.0	5		01/28/18 12:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-4 **Lab ID: 92370917003** Collected: 01/24/18 12:45 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:52	7440-38-2	
Barium	**300**	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:52	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:52	7440-43-9	
Calcium	**66700**	ug/L	100	1	01/26/18 04:40	01/29/18 19:52	7440-70-2	
Chromium	**5.7**	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-48-4	
Copper	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-50-8	
Lead	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7439-98-7	
Nickel	**6.9**	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:52	7782-49-2	
Silver	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:52	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:52	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 09:37	02/02/18 10:58	7440-42-8	
Lithium	**28.6**	ug/L	0.50	1	01/31/18 09:37	02/02/18 10:58	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 09:37	02/02/18 10:58	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:20	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 02:55	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 02:55	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 02:55	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 02:55	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 02:55	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 02:55	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 02:55	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 02:55	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 02:55	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 02:55	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 02:55	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 02:55	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 02:55	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 02:55	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 02:55	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 02:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:55	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 02:55	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 02:55	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:55	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-4 **Lab ID: 92370917003** Collected: 01/24/18 12:45 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 02:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 02:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 02:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 02:55	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 02:55	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 02:55	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 02:55	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 02:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 02:55	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 02:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 02:55	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 02:55	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 02:55	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 02:55	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 02:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 02:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 02:55	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 02:55	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 02:55	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 02:55	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 02:55	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/27/18 02:55	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		01/27/18 02:55	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1210**	mg/L	25.0	1		01/31/18 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**492**	mg/L	11.0	11		01/28/18 12:45	16887-00-6	
Fluoride	**0.32**	mg/L	0.10	1		01/28/18 00:27	16984-48-8	
Sulfate	**12.3**	mg/L	1.0	1		01/28/18 00:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-3 **Lab ID: 92370917004** Collected: 01/24/18 15:25 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**5.8**	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 20:40	7440-38-2	
Barium	**570**	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 20:40	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 20:40	7440-43-9	
Calcium	**169000**	ug/L	1000	10	01/26/18 04:40	01/29/18 19:56	7440-70-2	
Chromium	**5.3**	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-48-4	
Copper	**5.6**	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-50-8	
Lead	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7439-92-1	
Molybdenum	**6.9**	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 20:40	7782-49-2	
Silver	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:40	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 20:40	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**16.6**	ug/L	5.0	1	01/31/18 09:37	02/02/18 11:00	7440-42-8	
Lithium	**90.2**	ug/L	0.50	1	01/31/18 09:37	02/02/18 11:00	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 09:37	02/02/18 11:00	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:23	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 03:12	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 03:12	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 03:12	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 03:12	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 03:12	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 03:12	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 03:12	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 03:12	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 03:12	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 03:12	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 03:12	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 03:12	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 03:12	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 03:12	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 03:12	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 03:12	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 03:12	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 03:12	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 03:12	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 03:12	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-3 **Lab ID: 92370917004** Collected: 01/24/18 15:25 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 03:12	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:12	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:12	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:12	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 03:12	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 03:12	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 03:12	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 03:12	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 03:12	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 03:12	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 03:12	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 03:12	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 03:12	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 03:12	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 03:12	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 03:12	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 03:12	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 03:12	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 03:12	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 03:12	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 03:12	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 03:12	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 03:12	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 03:12	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 03:12	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/27/18 03:12	460-00-4	
1,2-Dichloroethane-d4 (S)	96	%	70-130	1		01/27/18 03:12	17060-07-0	
Toluene-d8 (S)	110	%	70-130	1		01/27/18 03:12	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1060**	mg/L	25.0	1		01/31/18 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**987**	mg/L	15.0	15		01/28/18 13:01	16887-00-6	
Fluoride	**0.46**	mg/L	0.10	1		01/28/18 00:43	16984-48-8	
Sulfate	**102**	mg/L	15.0	15		01/28/18 13:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: AMB **Lab ID: 92370917005** Collected: 01/24/18 17:00 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:59	7440-38-2	
Barium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:59	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 19:59	7440-43-9	
Calcium	ND	ug/L	100	1	01/26/18 04:40	01/29/18 19:59	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-48-4	
Copper	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-50-8	
Lead	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:59	7782-49-2	
Silver	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 19:59	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 19:59	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 09:37	02/02/18 11:33	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 09:37	02/02/18 11:33	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 09:37	02/02/18 11:33	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:25	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 03:29	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 03:29	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 03:29	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 03:29	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 03:29	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 03:29	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 03:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 03:29	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 03:29	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 03:29	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 03:29	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 03:29	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 03:29	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 03:29	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 03:29	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 03:29	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 03:29	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 03:29	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 03:29	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 03:29	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: AMB **Lab ID: 92370917005** Collected: 01/24/18 17:00 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 03:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 03:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 03:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 03:29	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 03:29	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 03:29	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 03:29	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 03:29	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 03:29	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 03:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 03:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 03:29	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 03:29	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 03:29	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 03:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 03:29	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 03:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 03:29	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 03:29	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 03:29	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 03:29	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 03:29	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 03:29	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		01/27/18 03:29	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/27/18 03:29	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/31/18 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/28/18 01:00	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/28/18 01:00	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/28/18 01:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: EQB **Lab ID: 92370917006** Collected: 01/24/18 17:20 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 20:02	7440-38-2	
Barium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 20:02	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/26/18 04:40	01/29/18 20:02	7440-43-9	
Calcium	ND	ug/L	100	1	01/26/18 04:40	01/29/18 20:02	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-48-4	
Copper	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-50-8	
Lead	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 20:02	7782-49-2	
Silver	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/26/18 04:40	01/29/18 20:02	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/26/18 04:40	01/29/18 20:02	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 09:37	02/02/18 11:36	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 09:37	02/02/18 11:36	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 09:37	02/02/18 11:36	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:41	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 03:46	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 03:46	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 03:46	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 03:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 03:46	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 03:46	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 03:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 03:46	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 03:46	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 03:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 03:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 03:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 03:46	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 03:46	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 03:46	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 03:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 03:46	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 03:46	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 03:46	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 03:46	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: EQB **Lab ID: 92370917006** Collected: 01/24/18 17:20 Received: 01/25/18 14:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 03:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 03:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 03:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 03:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 03:46	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 03:46	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 03:46	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 03:46	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 03:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 03:46	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 03:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 03:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 03:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 03:46	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 03:46	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 03:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 03:46	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 03:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 03:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 03:46	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 03:46	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 03:46	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 03:46	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/27/18 03:46	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	70-130	1		01/27/18 03:46	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		01/27/18 03:46	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/31/18 09:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/28/18 01:17	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/28/18 01:17	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/28/18 01:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: TRIP BLANK **Lab ID: 92370917007** Collected: 01/24/18 00:00 Received: 01/25/18 14:35 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		01/27/18 04:03	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 04:03	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 04:03	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 04:03	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 04:03	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 04:03	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 04:03	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 04:03	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 04:03	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 04:03	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 04:03	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 04:03	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 04:03	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 04:03	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 04:03	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 04:03	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:03	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:03	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 04:03	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:03	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:03	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:03	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:03	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:03	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 04:03	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:03	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:03	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 04:03	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 04:03	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 04:03	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 04:03	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 04:03	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 04:03	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:03	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:03	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 04:03	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 04:03	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:03	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:03	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 04:03	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 04:03	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 04:03	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 04:03	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 04:03	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 04:03	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/27/18 04:03	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: TRIP BLANK **Lab ID: 92370917007** Collected: 01/24/18 00:00 Received: 01/25/18 14:35 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)	96	%	70-130	1		01/27/18 04:03	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		01/27/18 04:03	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 395798 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 2194154 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	02/13/18 00:04	

LABORATORY CONTROL SAMPLE: 2194155

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: 2194156 2194157

Parameter	Units	92370715001 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	102	98	75-125	4	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 395600 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 2193091 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/29/18 19:03	
Arsenic	ug/L	ND	10.0	01/29/18 19:03	
Barium	ug/L	ND	5.0	01/29/18 19:03	
Beryllium	ug/L	ND	1.0	01/29/18 19:03	
Cadmium	ug/L	ND	1.0	01/29/18 19:03	
Calcium	ug/L	ND	100	01/29/18 19:03	
Chromium	ug/L	ND	5.0	01/29/18 19:03	
Cobalt	ug/L	ND	5.0	01/29/18 19:03	
Copper	ug/L	ND	5.0	01/29/18 19:03	
Lead	ug/L	ND	5.0	01/29/18 19:03	
Molybdenum	ug/L	ND	5.0	01/29/18 19:03	
Nickel	ug/L	ND	5.0	01/29/18 19:03	
Selenium	ug/L	ND	10.0	01/29/18 19:03	
Silver	ug/L	ND	5.0	01/29/18 19:03	
Vanadium	ug/L	ND	5.0	01/29/18 19:03	
Zinc	ug/L	ND	10.0	01/29/18 19:03	

LABORATORY CONTROL SAMPLE: 2193092

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	490	98	80-120	
Arsenic	ug/L	500	479	96	80-120	
Barium	ug/L	500	484	97	80-120	
Beryllium	ug/L	500	493	99	80-120	
Cadmium	ug/L	500	483	97	80-120	
Calcium	ug/L	5000	5010	100	80-120	
Chromium	ug/L	500	486	97	80-120	
Cobalt	ug/L	500	485	97	80-120	
Copper	ug/L	500	494	99	80-120	
Lead	ug/L	500	479	96	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Nickel	ug/L	500	482	96	80-120	
Selenium	ug/L	500	476	95	80-120	
Silver	ug/L	250	243	97	80-120	
Vanadium	ug/L	500	488	98	80-120	
Zinc	ug/L	500	484	97	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2193093 2193094

Parameter	Units	92370685001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L		500	500	493	496	98	99	75-125	1	20	
Arsenic	ug/L		500	500	492	500	97	99	75-125	2	20	
Barium	ug/L		500	500	585	584	94	94	75-125	0	20	
Beryllium	ug/L		500	500	490	488	98	98	75-125	0	20	
Cadmium	ug/L		500	500	488	490	98	98	75-125	0	20	
Calcium	ug/L		5000	5000	63500	61700	120	83	75-125	3	20	
Chromium	ug/L		500	500	499	492	92	90	75-125	1	20	
Cobalt	ug/L		500	500	479	482	96	96	75-125	1	20	
Copper	ug/L	243	500	500	690	660	89	83	75-125	5	20	
Lead	ug/L		500	500	563	561	92	92	75-125	0	20	
Molybdenum	ug/L		500	500	493	498	98	99	75-125	1	20	
Nickel	ug/L		500	500	499	500	94	94	75-125	0	20	
Selenium	ug/L		500	500	292	309	57	61	75-125	6	20	M1
Silver	ug/L		250	250	243	244	96	96	75-125	0	20	
Vanadium	ug/L		500	500	489	491	97	97	75-125	0	20	
Zinc	ug/L	181	500	500	656	656	95	95	75-125	0	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 520510 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 2826371 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/02/18 10:48	
Lithium	ug/L	ND	0.50	02/02/18 10:48	
Thallium	ug/L	ND	0.10	02/02/18 10:48	

LABORATORY CONTROL SAMPLE: 2826372

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	106	106	80-120	
Lithium	ug/L	100	111	111	80-120	
Thallium	ug/L	100	100	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2826373 2826374

Parameter	Units	92370917001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6.8	100	100	103	98.5	97	92	75-125	5	20	
Lithium	ug/L	53.7	100	100	159	153	105	100	75-125	3	20	
Thallium	ug/L	ND	100	100	94.4	90.4	94	90	75-125	4	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 395724 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006, 92370917007

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006, 92370917007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
2-Butanone (MEK)	ug/L	ND	5.0	01/26/18 22:26	
2-Hexanone	ug/L	ND	5.0	01/26/18 22:26	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/26/18 22:26	
Acetone	ug/L	ND	25.0	01/26/18 22:26	
Acrylonitrile	ug/L	ND	10.0	01/26/18 22:26	
Benzene	ug/L	ND	1.0	01/26/18 22:26	
Bromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromodichloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromoform	ug/L	ND	1.0	01/26/18 22:26	
Bromomethane	ug/L	ND	2.0	01/26/18 22:26	
Carbon disulfide	ug/L	ND	2.0	01/26/18 22:26	
Carbon tetrachloride	ug/L	ND	1.0	01/26/18 22:26	
Chlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
Chloroethane	ug/L	ND	1.0	01/26/18 22:26	
Chloroform	ug/L	ND	1.0	01/26/18 22:26	
Chloromethane	ug/L	ND	1.0	01/26/18 22:26	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
Dibromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Dibromomethane	ug/L	ND	1.0	01/26/18 22:26	
Ethylbenzene	ug/L	ND	1.0	01/26/18 22:26	
Iodomethane	ug/L	ND	5.0	01/26/18 22:26	
Methylene Chloride	ug/L	ND	1.0	01/26/18 22:26	
Styrene	ug/L	ND	1.0	01/26/18 22:26	
Tetrachloroethene	ug/L	ND	1.0	01/26/18 22:26	
Toluene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/26/18 22:26	
Trichloroethene	ug/L	ND	1.0	01/26/18 22:26	

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006, 92370917007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/26/18 22:26	
Vinyl acetate	ug/L	ND	2.0	01/26/18 22:26	
Vinyl chloride	ug/L	ND	1.0	01/26/18 22:26	
Xylene (Total)	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane-d4 (S)	%	98	70-130	01/26/18 22:26	
4-Bromofluorobenzene (S)	%	97	70-130	01/26/18 22:26	
Toluene-d8 (S)	%	106	70-130	01/26/18 22:26	

LABORATORY CONTROL SAMPLE: 2193798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.2	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.6	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.2	102	79-124	
1,1,2-Trichloroethane	ug/L	50	51.4	103	85-125	
1,1-Dichloroethane	ug/L	50	49.3	99	73-126	
1,1-Dichloroethene	ug/L	50	53.1	106	66-135	
1,2,3-Trichloropropane	ug/L	50	52.5	105	75-130	
1,2-Dichlorobenzene	ug/L	50	48.9	98	80-133	
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	52.8	106	75-132	
1,4-Dichlorobenzene	ug/L	50	49.7	99	78-130	
2-Butanone (MEK)	ug/L	100	104	104	61-144	
2-Hexanone	ug/L	100	102	102	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	109	109	72-135	
Acetone	ug/L	100	115	115	48-146	
Acrylonitrile	ug/L	250	272	109	40-160	
Benzene	ug/L	50	51.7	103	80-125	
Bromochloromethane	ug/L	50	47.0	94	71-125	
Bromodichloromethane	ug/L	50	46.9	94	78-124	
Bromoform	ug/L	50	49.1	98	71-128	
Bromomethane	ug/L	50	43.9	88	40-160	
Carbon disulfide	ug/L	50	56.5	113	50-160	
Carbon tetrachloride	ug/L	50	44.4	89	69-131	
Chlorobenzene	ug/L	50	49.9	100	81-122	
Chloroethane	ug/L	50	53.6	107	39-148	
Chloroform	ug/L	50	44.9	90	73-127	
Chloromethane	ug/L	50	46.1	92	44-146	
cis-1,2-Dichloroethene	ug/L	50	49.8	100	74-124	
cis-1,3-Dichloropropene	ug/L	50	53.5	107	72-132	
Dibromochloromethane	ug/L	50	50.1	100	78-125	
Dibromomethane	ug/L	50	45.4	91	82-120	
Ethylbenzene	ug/L	50	49.8	100	79-121	
Iodomethane	ug/L	100	103	103	39-154	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

LABORATORY CONTROL SAMPLE: 2193798

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	50.6	101	84-126	
Tetrachloroethene	ug/L	50	49.2	98	78-122	
Toluene	ug/L	50	49.5	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	51.8	104	71-127	
trans-1,3-Dichloropropene	ug/L	50	51.4	103	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	47.5	95	40-160	
Trichloroethene	ug/L	50	52.2	104	78-122	
Trichlorofluoromethane	ug/L	50	42.1	84	53-137	
Vinyl acetate	ug/L	100	95.9	96	40-160	
Vinyl chloride	ug/L	50	55.4	111	58-137	
Xylene (Total)	ug/L	150	152	101	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.3	97	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.2	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.5	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	24.4	122	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.0	130	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.5	107	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.1	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.1	105	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.5	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.3	101	70-130	
2-Hexanone	ug/L	ND	40	38.3	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.7	99	70-130	
Acetone	ug/L	ND	40	46.1	115	70-130	
Acrylonitrile	ug/L	ND	100	123	123	70-130	
Benzene	ug/L	ND	20	23.1	116	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	18.3	91	70-130	
Bromomethane	ug/L	ND	20	19.6	98	70-130	
Carbon disulfide	ug/L	ND	20	24.1	121	70-130	
Carbon tetrachloride	ug/L	ND	20	21.3	106	70-130	
Chlorobenzene	ug/L	ND	20	21.6	108	70-146	
Chloroethane	ug/L	ND	20	24.5	122	70-130	
Chloroform	ug/L	ND	20	21.0	105	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	23.2	115	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.7	118	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.4	102	70-130	
Dibromochloromethane	ug/L	ND	20	19.8	99	70-130	
Dibromomethane	ug/L	ND	20	19.5	97	70-130	
Ethylbenzene	ug/L	ND	20	22.4	112	70-130	
Iodomethane	ug/L	ND	40	48.7	122	70-130	
Methylene Chloride	ug/L	ND	20	23.3	117	70-130	
Styrene	ug/L	ND	20	21.5	108	70-130	
Tetrachloroethene	ug/L	ND	20	21.6	108	70-130	
Toluene	ug/L	ND	20	21.7	108	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	24.4	122	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.8	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.7	84	70-130	
Trichloroethene	ug/L	ND	20	23.2	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.3	112	70-130	
Vinyl acetate	ug/L	ND	40	31.7	79	70-130	
Vinyl chloride	ug/L	ND	20	26.1	130	70-130	
Xylene (Total)	ug/L	ND	60	67.0	112	70-130	
1,2-Dichloroethane-d4 (S)	%				99	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 Result	Dup Result	RPD	Max RPD	Qualifiers
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	.18J		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)	%	94	99	5		
4-Bromofluorobenzene (S)	%	97	97	0		
Toluene-d8 (S)	%	110	105	4		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 396123 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 2196069 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/31/18 09:55	

LABORATORY CONTROL SAMPLE: 2196070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	240	96	90-110	

SAMPLE DUPLICATE: 2196071

Parameter	Units	92370779003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	71.0	64.0	10	5	D6

SAMPLE DUPLICATE: 2196072

Parameter	Units	92370781008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	79.0	77.0	3	5	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 395756 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 2193948 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/27/18 16:17	
Fluoride	mg/L	ND	0.10	01/27/18 16:17	
Sulfate	mg/L	ND	1.0	01/27/18 16:17	

LABORATORY CONTROL SAMPLE: 2193949

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	103	90-110	
Sulfate	mg/L	50	52.4	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2193950 2193951

Parameter	Units	92370562001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.8	50	50	54.9	55.5	100	101	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.6	2.7	105	106	90-110	1	10	
Sulfate	mg/L	6.6	50	50	58.5	59.2	104	105	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2193952 2193953

Parameter	Units	92370675003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	50	50	50.7	51.3	101	103	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.6	2.6	103	105	90-110	2	10	
Sulfate	mg/L	ND	50	50	53.0	53.8	106	108	90-110	1	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-6 **Lab ID: 92370917001** Collected: 01/24/18 09:30 Received: 01/25/18 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0517 ± 0.268 (0.557) C:NA T:84%**	pCi/L	02/10/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**1.07 ± 0.603 (1.10) C:80% T:81%**	pCi/L	02/06/18 19:03	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-6 DUP **Lab ID: 92370917002** Collected: 01/24/18 09:30 Received: 01/25/18 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.278 ± 0.423 (0.728) C:NA T:84%**	pCi/L	02/10/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**0.874 ± 0.629 (1.22) C:74% T:78%**	pCi/L	02/06/18 19:03	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-4 **Lab ID: 92370917003** Collected: 01/24/18 12:45 Received: 01/25/18 14:35 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 ± 0.277 (0.599) C:NA T:90%**	pCi/L	02/10/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**0.710 ± 0.549 (1.08) C:83% T:74%**	pCi/L	02/06/18 19:03	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: MW-3 **Lab ID: 92370917004** Collected: 01/24/18 15:25 Received: 01/25/18 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.21 ± 0.567 (0.511) C:NA T:85%**	pCi/L	02/10/18 19:06	13982-63-3	
Radium-228	EPA 904.0	**1.08 ± 0.411 (0.591) C:80% T:85%**	pCi/L	02/06/18 12:15	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: AMB **Lab ID: 92370917005** Collected: 01/24/18 17:00 Received: 01/25/18 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.257 ± 0.237 (0.140) C:NA T:89%**	pCi/L	02/10/18 19:06	13982-63-3	
Radium-228	EPA 904.0	**0.536 ± 0.522 (1.08) C:83% T:83%**	pCi/L	02/06/18 15:30	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Sample: EQB **Lab ID: 92370917006** Collected: 01/24/18 17:20 Received: 01/25/18 14:35 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.169 ± 0.257 (0.414) C:NA T:80%**	pCi/L	02/10/18 19:06	13982-63-3	
Radium-228	EPA 904.0	**0.474 ± 0.339 (0.647) C:78% T:76%**	pCi/L	02/06/18 11:51	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 286444 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 1404745 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.784 ± 0.363 (0.579) C:82% T:74%	pCi/L	02/06/18 11:51	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

QC Batch: 286438 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

METHOD BLANK: 1404739 Matrix: Water
Associated Lab Samples: 92370917001, 92370917002, 92370917003, 92370917004, 92370917005, 92370917006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.278 ± 0.290 (0.409) C:NA T:84%	pCi/L	02/10/18 18:24	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

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.

TNTC - Too Numerous To Count

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.

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

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.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92370917001	**MW-6**	EPA 3010A	395600	EPA 6010	395715
92370917002	**MW-6 DUP**	EPA 3010A	395600	EPA 6010	395715
92370917003	**MW-4**	EPA 3010A	395600	EPA 6010	395715
92370917004	**MW-3**	EPA 3010A	395600	EPA 6010	395715
92370917005	**AMB**	EPA 3010A	395600	EPA 6010	395715
92370917006	**EQB**	EPA 3010A	395600	EPA 6010	395715
92370917001	**MW-6**	EPA 3020	520510	EPA 6020B	520662
92370917002	**MW-6 DUP**	EPA 3020	520510	EPA 6020B	520662
92370917003	**MW-4**	EPA 3020	520510	EPA 6020B	520662
92370917004	**MW-3**	EPA 3020	520510	EPA 6020B	520662
92370917005	**AMB**	EPA 3020	520510	EPA 6020B	520662
92370917006	**EQB**	EPA 3020	520510	EPA 6020B	520662
92370917001	**MW-6**	EPA 7470	395798	EPA 7470	395820
92370917002	**MW-6 DUP**	EPA 7470	395798	EPA 7470	395820
92370917003	**MW-4**	EPA 7470	395798	EPA 7470	395820
92370917004	**MW-3**	EPA 7470	395798	EPA 7470	395820
92370917005	**AMB**	EPA 7470	395798	EPA 7470	395820
92370917006	**EQB**	EPA 7470	395798	EPA 7470	395820
92370917001	**MW-6**	EPA 8260	395724		
92370917002	**MW-6 DUP**	EPA 8260	395724		
92370917003	**MW-4**	EPA 8260	395724		
92370917004	**MW-3**	EPA 8260	395724		
92370917005	**AMB**	EPA 8260	395724		
92370917006	**EQB**	EPA 8260	395724		
92370917007	**TRIP BLANK**	EPA 8260	395724		
92370917001	**MW-6**	EPA 903.1	286438		
92370917002	**MW-6 DUP**	EPA 903.1	286438		
92370917003	**MW-4**	EPA 903.1	286438		
92370917004	**MW-3**	EPA 903.1	286438		
92370917005	**AMB**	EPA 903.1	286438		
92370917006	**EQB**	EPA 903.1	286438		
92370917001	**MW-6**	EPA 904.0	286444		
92370917002	**MW-6 DUP**	EPA 904.0	286444		
92370917003	**MW-4**	EPA 904.0	286444		
92370917004	**MW-3**	EPA 904.0	286444		
92370917005	**AMB**	EPA 904.0	286444		
92370917006	**EQB**	EPA 904.0	286444		
92370917001	**MW-6**	SM 2540C	396123		
92370917002	**MW-6 DUP**	SM 2540C	396123		
92370917003	**MW-4**	SM 2540C	396123		
92370917004	**MW-3**	SM 2540C	396123		
92370917005	**AMB**	SM 2540C	396123		
92370917006	**EQB**	SM 2540C	396123		
92370917001	**MW-6**	EPA 300.0	395756		
92370917002	**MW-6 DUP**	EPA 300.0	395756		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370917

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92370917003	**MW-4**	EPA 300.0	395756		
92370917004	**MW-3**	EPA 300.0	395756		
92370917005	**AMB**	EPA 300.0	395756		
92370917006	**EQB**	EPA 300.0	395756		

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: August 4, 2017 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.04	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: HDR Engineering

Project WO#: 92370917

92370917

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: 1-25-18 SL

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer: ☐ IR Gun ID: T170y

Type of Ice: ☑ Wet ☐ Blue ☐ None

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A

Correction Factor: **Cooler Temp Corrected (°C):** 3.6

Temp should be above freezing to 6°C

☐ Samples out of temp criteria. Samples on ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☑ No	☐ N/A	8.
Sample Labels Match COC?	☐ Yes	☑ No	☐ N/A	9. Received trip blank vials. Not on COC. No times/dates
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Lot ID of split containers: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

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)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project #

WO#: 92370917

PM: KLH1 Due Date: 02/01/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP1N 1 liter HNO3	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1		1	1			2										3													
2		1	1			2										3									3	1			
3		1	1			2	1									3									3	1			
4		1	1			2	1									3									3	1			
5																									3				
6		1	1			2	1									3													
7		1	1			2	1									3									3	1			
8																3									3	1			
9																2													
10																													
11																													
12																													

TB CX

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A — Required Client Information:

Company:	HDR Engineering
Address:	440 South Church Street
	Charlotte, NC 28202
Email:	sean.quarry@hdrinc.com
Phone:	(704)248-3632 Fax:
Requested Due Date:	

Section B — Required Project Information:

Report To:	Sean Quarry
Copy To:	
Purchase Order #:	
Project Name:	Charrah-Brickhaven
Project #:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	kevin.godwin@pacelabs.com,
Pace Profile #:	7672-1

Regulatory Agency:

State / Location: NC

SAMPLE ID — One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	
	Requested Analysis Filtered (Y/N)																										92570917
1	MW-6	WT	G			1/24/18	930	14.4	10	2		5	3							3	1	1	3	1	1		W1
2	MW-6 DUPE	WT	G			1/24/18	930	14.4	10	2		5	3							3	1	1	3	1	1		W2
3	MW-4	WT	G			1/24/18	1245	16.7	10	2		5	3							3	1	1	3	1	1		W3
4	MW-3	WT	G			1/24/18	1525	16.3	10	2		5	3							3	1	1	3	1	1		W4
5																											
6	AMB	WT	G			1/24/18	1700		10	2		5	3							3	1	1	3	1	1		W5
7	EQB	WT	G			1/24/18	1720		10	2		5	3							3	1	1	3	1	1		W6
8																											W7-TB
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jesse Allred RACA	1/24/18	1835	Paul HM	1-25-18	1435	3.6	4	N	4
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Allred

SIGNATURE of SAMPLER: Jesse Allred

DATE Signed: 1-24-18

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

February 13, 2018

Sean Quarry
HDR Engineering
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory on January 26, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Bonnie Vang for
Kevin Herring
kevin.herring@pacelabs.com
1(704)875-9092
HORIZON Database Administrator

Enclosures

cc: Mike Plummer, HDR

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

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
Louisiana/NELAP Certification # LA170028
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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92370945001	**MW-5**	Water	01/25/18 09:55	01/26/18 06:30
92370945002	**MW-1**	Water	01/25/18 15:00	01/26/18 06:30
92370945003	**MW-2**	Water	01/25/18 17:20	01/26/18 06:30
92370945004	**AMB**	Water	01/25/18 11:30	01/26/18 06:30
92370945005	**EQB**	Water	01/25/18 15:30	01/26/18 06:30
92370945006	**TRIP BLANK**	Water	01/25/18 00:00	01/26/18 06:30

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92370945001	**MW-5**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370945002	**MW-1**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370945003	**MW-2**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370945004	**AMB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370945005	**EQB**	EPA 6010	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470	WAB	1	PASI-A
		EPA 8260	GAW	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92370945006	**TRIP BLANK**	EPA 8260	GAW	48	PASI-C

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370945001	**MW-5**					
EPA 6010	Barium	123	ug/L	5.0	01/30/18 05:58	
EPA 6010	Calcium	15100	ug/L	100	01/30/18 05:58	
EPA 6010	Chromium	15.3	ug/L	5.0	01/30/18 05:58	
EPA 6010	Copper	6.9	ug/L	5.0	01/30/18 05:58	
EPA 6010	Nickel	9.0	ug/L	5.0	01/30/18 05:58	
EPA 6020B	Boron	11.2	ug/L	5.0	02/05/18 09:56	
EPA 6020B	Lithium	7.1	ug/L	0.50	02/05/18 09:56	
EPA 903.1	Radium-226	0.153 ± 0.475 (0.919) C:NA T:85%	pCi/L		02/06/18 18:52	
EPA 904.0	Radium-228	-0.0690 ± 0.392 (0.914) C:74% T:87%	pCi/L		02/05/18 14:43	
SM 2540C	Total Dissolved Solids	246	mg/L	25.0	01/31/18 10:15	
EPA 300.0	Chloride	19.7	mg/L	1.0	01/30/18 20:13	
EPA 300.0	Fluoride	0.68	mg/L	0.10	01/30/18 20:13	
EPA 300.0	Sulfate	5.3	mg/L	1.0	01/30/18 20:13	
92370945002	**MW-1**					
EPA 6010	Barium	175	ug/L	5.0	01/30/18 06:58	
EPA 6010	Calcium	146000	ug/L	1000	01/30/18 06:01	
EPA 6010	Chromium	18.4	ug/L	5.0	01/30/18 06:58	
EPA 6010	Nickel	13.3	ug/L	5.0	01/30/18 06:58	
EPA 6010	Zinc	16.1	ug/L	10.0	01/30/18 06:58	
EPA 6020B	Boron	6.2	ug/L	5.0	02/05/18 10:01	
EPA 6020B	Lithium	33.3	ug/L	0.50	02/05/18 10:01	
EPA 903.1	Radium-226	0.225 ± 0.442 (0.808) C:NA T:89%	pCi/L		02/06/18 18:52	
EPA 904.0	Radium-228	0.537 ± 0.330 (0.613) C:76% T:94%	pCi/L		02/05/18 14:44	
SM 2540C	Total Dissolved Solids	1020	mg/L	125	01/31/18 10:15	
EPA 300.0	Chloride	547	mg/L	11.0	01/31/18 09:26	
EPA 300.0	Fluoride	0.12	mg/L	0.10	01/30/18 20:30	
EPA 300.0	Sulfate	6.6	mg/L	1.0	01/30/18 20:30	
92370945003	**MW-2**					
EPA 6010	Antimony	6.9	ug/L	5.0	01/30/18 07:01	
EPA 6010	Barium	314	ug/L	5.0	01/30/18 07:01	
EPA 6010	Calcium	182000	ug/L	1000	01/30/18 06:04	
EPA 6010	Chromium	56.8	ug/L	5.0	01/30/18 07:01	
EPA 6010	Copper	6.6	ug/L	5.0	01/30/18 07:01	
EPA 6010	Molybdenum	7.1	ug/L	5.0	01/30/18 07:01	
EPA 6010	Nickel	33.8	ug/L	5.0	01/30/18 07:01	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92370945003	**MW-2**					
EPA 6020B	Boron	40.7	ug/L	5.0	02/05/18 10:05	
EPA 6020B	Lithium	96.6	ug/L	0.50	02/05/18 10:05	
EPA 903.1	Radium-226	0.648 ± 0.706 (1.11) C:NA T:78%	pCi/L		02/06/18 18:52	
EPA 904.0	Radium-228	0.716 ± 0.398 (0.711) C:76% T:88%	pCi/L		02/05/18 14:44	
SM 2540C	Total Dissolved Solids	2300	mg/L	25.0	01/31/18 10:15	
EPA 300.0	Chloride	1180	mg/L	26.0	02/01/18 11:19	M6
EPA 300.0	Fluoride	0.28	mg/L	0.10	01/31/18 21:25	
EPA 300.0	Sulfate	73.3	mg/L	1.0	01/31/18 21:25	
92370945004	**AMB**					
EPA 903.1	Radium-226	0.256 ± 0.555 (1.02) C:NA T:82%	pCi/L		02/06/18 18:52	
EPA 904.0	Radium-228	-0.0230 ± 0.423 (0.981) C:76% T:72%	pCi/L		02/05/18 14:44	
92370945005	**EQB**					
EPA 903.1	Radium-226	0.336 ± 0.386 (0.228) C:NA T:79%	pCi/L		02/06/18 18:52	
EPA 904.0	Radium-228	0.240 ± 0.334 (0.715) C:81% T:78%	pCi/L		02/05/18 14:44	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-5 **Lab ID: 92370945001** Collected: 01/25/18 09:55 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 05:58	7440-38-2	
Barium	**123**	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 05:58	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 05:58	7440-43-9	
Calcium	**15100**	ug/L	100	1	01/27/18 03:40	01/30/18 05:58	7440-70-2	
Chromium	**15.3**	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-48-4	
Copper	**6.9**	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-50-8	
Lead	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7439-98-7	
Nickel	**9.0**	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 05:58	7782-49-2	
Silver	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 05:58	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 05:58	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**11.2**	ug/L	5.0	1	01/31/18 10:37	02/05/18 09:56	7440-42-8	
Lithium	**7.1**	ug/L	0.50	1	01/31/18 10:37	02/05/18 09:56	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 09:56	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:50	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 04:19	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 04:19	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 04:19	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 04:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 04:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 04:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 04:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 04:19	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 04:19	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 04:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 04:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 04:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 04:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 04:19	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 04:19	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 04:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:19	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:19	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 04:19	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:19	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-5 **Lab ID: 92370945001** Collected: 01/25/18 09:55 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 04:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:19	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 04:19	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 04:19	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 04:19	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 04:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 04:19	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 04:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 04:19	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 04:19	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 04:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 04:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 04:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 04:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 04:19	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 04:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		01/27/18 04:19	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/27/18 04:19	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		01/27/18 04:19	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**246**	mg/L	25.0	1		01/31/18 10:15		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**19.7**	mg/L	1.0	1		01/30/18 20:13	16887-00-6	
Fluoride	**0.68**	mg/L	0.10	1		01/30/18 20:13	16984-48-8	
Sulfate	**5.3**	mg/L	1.0	1		01/30/18 20:13	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-1 **Lab ID: 92370945002** Collected: 01/25/18 15:00 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:58	7440-38-2	
Barium	**175**	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 06:58	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 06:58	7440-43-9	
Calcium	**146000**	ug/L	1000	10	01/27/18 03:40	01/30/18 06:01	7440-70-2	
Chromium	**18.4**	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-48-4	
Copper	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-50-8	
Lead	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7439-98-7	
Nickel	**13.3**	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:58	7782-49-2	
Silver	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:58	7440-62-2	
Zinc	**16.1**	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:58	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**6.2**	ug/L	5.0	1	01/31/18 10:37	02/05/18 10:01	7440-42-8	
Lithium	**33.3**	ug/L	0.50	1	01/31/18 10:37	02/05/18 10:01	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 10:01	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:53	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 04:36	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 04:36	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 04:36	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 04:36	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 04:36	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 04:36	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 04:36	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 04:36	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 04:36	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 04:36	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 04:36	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 04:36	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 04:36	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 04:36	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 04:36	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 04:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:36	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:36	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 04:36	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:36	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-1 **Lab ID: 92370945002** Collected: 01/25/18 15:00 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:36	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:36	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 04:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:36	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 04:36	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 04:36	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 04:36	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 04:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 04:36	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 04:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:36	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 04:36	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 04:36	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:36	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 04:36	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 04:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 04:36	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 04:36	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 04:36	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 04:36	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		01/27/18 04:36	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		01/27/18 04:36	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		01/27/18 04:36	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**1020**	mg/L	125	1		01/31/18 10:15		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**547**	mg/L	11.0	11		01/31/18 09:26	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		01/30/18 20:30	16984-48-8	
Sulfate	**6.6**	mg/L	1.0	1		01/30/18 20:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-2 **Lab ID: 92370945003** Collected: 01/25/18 17:20 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	**6.9**	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 07:01	7440-38-2	
Barium	**314**	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 07:01	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 07:01	7440-43-9	
Calcium	**182000**	ug/L	1000	10	01/27/18 03:40	01/30/18 06:04	7440-70-2	
Chromium	**56.8**	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-48-4	
Copper	**6.6**	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-50-8	
Lead	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7439-92-1	
Molybdenum	**7.1**	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7439-98-7	
Nickel	**33.8**	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 07:01	7782-49-2	
Silver	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 07:01	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 07:01	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**40.7**	ug/L	5.0	1	01/31/18 10:37	02/05/18 10:05	7440-42-8	
Lithium	**96.6**	ug/L	0.50	1	01/31/18 10:37	02/05/18 10:05	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/05/18 10:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:55	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 04:53	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 04:53	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 04:53	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 04:53	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 04:53	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 04:53	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 04:53	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 04:53	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 04:53	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 04:53	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 04:53	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 04:53	75-00-3	M1
Chloroform	ND	ug/L	1.0	1		01/27/18 04:53	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 04:53	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 04:53	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 04:53	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:53	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 04:53	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 04:53	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:53	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-2 **Lab ID: 92370945003** Collected: 01/25/18 17:20 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 04:53	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:53	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:53	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 04:53	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 04:53	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:53	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 04:53	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 04:53	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 04:53	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 04:53	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 04:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 04:53	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 04:53	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:53	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 04:53	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 04:53	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 04:53	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:53	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 04:53	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 04:53	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 04:53	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 04:53	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 04:53	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 04:53	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 04:53	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 04:53	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130	1		01/27/18 04:53	17060-07-0	
Toluene-d8 (S)	106	%	70-130	1		01/27/18 04:53	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**2300**	mg/L	25.0	1		01/31/18 10:15		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**1180**	mg/L	26.0	26		02/01/18 11:19	16887-00-6	M6
Fluoride	**0.28**	mg/L	0.10	1		01/31/18 21:25	16984-48-8	
Sulfate	**73.3**	mg/L	1.0	1		01/31/18 21:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: AMB **Lab ID: 92370945004** Collected: 01/25/18 11:30 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:13	7440-38-2	
Barium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 06:13	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 06:13	7440-43-9	
Calcium	ND	ug/L	100	1	01/27/18 03:40	01/30/18 06:13	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-48-4	
Copper	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-50-8	
Lead	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:13	7782-49-2	
Silver	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:13	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:13	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 10:37	02/02/18 16:03	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 10:37	02/02/18 16:03	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/02/18 16:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 00:57	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 05:10	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 05:10	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 05:10	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 05:10	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 05:10	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 05:10	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 05:10	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 05:10	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 05:10	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 05:10	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 05:10	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 05:10	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 05:10	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 05:10	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 05:10	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 05:10	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 05:10	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 05:10	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 05:10	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 05:10	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: AMB **Lab ID: 92370945004** Collected: 01/25/18 11:30 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 05:10	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 05:10	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 05:10	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 05:10	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 05:10	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 05:10	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 05:10	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 05:10	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 05:10	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 05:10	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 05:10	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 05:10	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 05:10	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 05:10	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 05:10	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 05:10	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 05:10	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 05:10	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 05:10	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 05:10	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 05:10	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 05:10	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 05:10	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 05:10	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 05:10	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		01/27/18 05:10	460-00-4	
1,2-Dichloroethane-d4 (S)	97	%	70-130	1		01/27/18 05:10	17060-07-0	
Toluene-d8 (S)	104	%	70-130	1		01/27/18 05:10	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/31/18 10:16		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/31/18 23:03	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/31/18 23:03	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/31/18 23:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: EQB **Lab ID: 92370945005** Collected: 01/25/18 15:30 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-36-0	
Arsenic	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:17	7440-38-2	
Barium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-39-3	
Beryllium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 06:17	7440-41-7	
Cadmium	ND	ug/L	1.0	1	01/27/18 03:40	01/30/18 06:17	7440-43-9	
Calcium	ND	ug/L	100	1	01/27/18 03:40	01/30/18 06:17	7440-70-2	
Chromium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-47-3	
Cobalt	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-48-4	
Copper	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-50-8	
Lead	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7439-98-7	
Nickel	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-02-0	
Selenium	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:17	7782-49-2	
Silver	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-22-4	
Vanadium	ND	ug/L	5.0	1	01/27/18 03:40	01/30/18 06:17	7440-62-2	
Zinc	ND	ug/L	10.0	1	01/27/18 03:40	01/30/18 06:17	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	5.0	1	01/31/18 10:37	02/02/18 16:07	7440-42-8	
Lithium	ND	ug/L	0.50	1	01/31/18 10:37	02/02/18 16:07	7439-93-2	
Thallium	ND	ug/L	0.10	1	01/31/18 10:37	02/02/18 16:07	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	02/12/18 13:08	02/13/18 01:00	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
Acetone	ND	ug/L	25.0	1		01/27/18 05:44	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 05:44	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 05:44	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 05:44	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 05:44	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 05:44	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 05:44	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 05:44	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 05:44	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 05:44	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 05:44	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 05:44	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 05:44	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 05:44	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 05:44	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 05:44	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 05:44	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 05:44	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 05:44	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 05:44	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: EQB **Lab ID: 92370945005** Collected: 01/25/18 15:30 Received: 01/26/18 06:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260							
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 05:44	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 05:44	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 05:44	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 05:44	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 05:44	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 05:44	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 05:44	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 05:44	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 05:44	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 05:44	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 05:44	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 05:44	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 05:44	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 05:44	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 05:44	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 05:44	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 05:44	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 05:44	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 05:44	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 05:44	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 05:44	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 05:44	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 05:44	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 05:44	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 05:44	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		01/27/18 05:44	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		01/27/18 05:44	17060-07-0	
Toluene-d8 (S)	105	%	70-130	1		01/27/18 05:44	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	ND	mg/L	25.0	1		01/31/18 10:17		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	ND	mg/L	1.0	1		01/31/18 23:20	16887-00-6	
Fluoride	ND	mg/L	0.10	1		01/31/18 23:20	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/31/18 23:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: TRIP BLANK **Lab ID: 92370945006** Collected: 01/25/18 00:00 Received: 01/26/18 06:30 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		01/27/18 06:01	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		01/27/18 06:01	107-13-1	
Benzene	ND	ug/L	1.0	1		01/27/18 06:01	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		01/27/18 06:01	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		01/27/18 06:01	75-27-4	
Bromoform	ND	ug/L	1.0	1		01/27/18 06:01	75-25-2	
Bromomethane	ND	ug/L	2.0	1		01/27/18 06:01	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		01/27/18 06:01	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		01/27/18 06:01	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		01/27/18 06:01	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		01/27/18 06:01	108-90-7	
Chloroethane	ND	ug/L	1.0	1		01/27/18 06:01	75-00-3	
Chloroform	ND	ug/L	1.0	1		01/27/18 06:01	67-66-3	
Chloromethane	ND	ug/L	1.0	1		01/27/18 06:01	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		01/27/18 06:01	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		01/27/18 06:01	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 06:01	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		01/27/18 06:01	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		01/27/18 06:01	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		01/27/18 06:01	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		01/27/18 06:01	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		01/27/18 06:01	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 06:01	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		01/27/18 06:01	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		01/27/18 06:01	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 06:01	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		01/27/18 06:01	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		01/27/18 06:01	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		01/27/18 06:01	591-78-6	
Iodomethane	ND	ug/L	5.0	1		01/27/18 06:01	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		01/27/18 06:01	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		01/27/18 06:01	108-10-1	
Styrene	ND	ug/L	1.0	1		01/27/18 06:01	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 06:01	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		01/27/18 06:01	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		01/27/18 06:01	127-18-4	
Toluene	ND	ug/L	1.0	1		01/27/18 06:01	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		01/27/18 06:01	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		01/27/18 06:01	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		01/27/18 06:01	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		01/27/18 06:01	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		01/27/18 06:01	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		01/27/18 06:01	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		01/27/18 06:01	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		01/27/18 06:01	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	97	%	70-130	1		01/27/18 06:01	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: TRIP BLANK **Lab ID: 92370945006** Collected: 01/25/18 00:00 Received: 01/26/18 06:30 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		01/27/18 06:01	17060-07-0	
Toluene-d8 (S)	108	%	70-130	1		01/27/18 06:01	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 395798 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

METHOD BLANK: 2194154 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	02/13/18 00:04	

LABORATORY CONTROL SAMPLE: 2194155

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: 2194156 2194157

Parameter	Units	92370715001 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	102	98	75-125	4	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 395740 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

METHOD BLANK: 2193898 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	01/30/18 05:14	
Arsenic	ug/L	ND	10.0	01/30/18 05:14	
Barium	ug/L	ND	5.0	01/30/18 05:14	
Beryllium	ug/L	ND	1.0	01/30/18 05:14	
Cadmium	ug/L	ND	1.0	01/30/18 05:14	
Calcium	ug/L	ND	100	01/30/18 05:14	
Chromium	ug/L	ND	5.0	01/30/18 05:14	
Cobalt	ug/L	ND	5.0	01/30/18 05:14	
Copper	ug/L	ND	5.0	01/30/18 05:14	
Lead	ug/L	ND	5.0	01/30/18 05:14	
Molybdenum	ug/L	ND	5.0	01/30/18 05:14	
Nickel	ug/L	ND	5.0	01/30/18 05:14	
Selenium	ug/L	ND	10.0	01/30/18 05:14	
Silver	ug/L	ND	5.0	01/30/18 05:14	
Vanadium	ug/L	ND	5.0	01/30/18 05:14	
Zinc	ug/L	ND	10.0	01/30/18 05:14	

LABORATORY CONTROL SAMPLE: 2193899

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	472	94	80-120	
Arsenic	ug/L	500	455	91	80-120	
Barium	ug/L	500	484	97	80-120	
Beryllium	ug/L	500	490	98	80-120	
Cadmium	ug/L	500	478	96	80-120	
Calcium	ug/L	5000	5150	103	80-120	
Chromium	ug/L	500	486	97	80-120	
Cobalt	ug/L	500	473	95	80-120	
Copper	ug/L	500	486	97	80-120	
Lead	ug/L	500	471	94	80-120	
Molybdenum	ug/L	500	490	98	80-120	
Nickel	ug/L	500	477	95	80-120	
Selenium	ug/L	500	455	91	80-120	
Silver	ug/L	250	241	96	80-120	
Vanadium	ug/L	500	493	99	80-120	
Zinc	ug/L	500	477	95	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2193900 2193901

Parameter	Units	92370914001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L		500	500	474	468	95	94	75-125	1	20	
Arsenic	ug/L		500	500	469	467	94	93	75-125	0	20	
Barium	ug/L		500	500	533	531	96	96	75-125	0	20	
Beryllium	ug/L		500	500	494	486	99	97	75-125	2	20	
Cadmium	ug/L		500	500	488	479	98	96	75-125	2	20	
Calcium	ug/L		5000	5000	69700	71600	43	82	75-125	3	20	M1
Chromium	ug/L		500	500	489	478	97	95	75-125	2	20	
Cobalt	ug/L		500	500	469	461	94	92	75-125	2	20	
Copper	ug/L	72.7	500	500	567	558	99	97	75-125	2	20	
Lead	ug/L		500	500	463	454	92	90	75-125	2	20	
Molybdenum	ug/L		500	500	493	485	98	96	75-125	2	20	
Nickel	ug/L		500	500	475	468	93	92	75-125	1	20	
Selenium	ug/L		500	500	450	449	90	89	75-125	0	20	
Silver	ug/L		250	250	243	240	97	95	75-125	1	20	
Vanadium	ug/L		500	500	500	491	100	98	75-125	2	20	
Zinc	ug/L	329	500	500	797	794	94	93	75-125	0	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 520509 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

METHOD BLANK: 2826367 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	5.0	02/05/18 08:30	
Lithium	ug/L	ND	0.50	02/02/18 14:10	
Thallium	ug/L	ND	0.10	02/02/18 14:10	

LABORATORY CONTROL SAMPLE: 2826368

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	106	106	80-120	
Lithium	ug/L	100	102	102	80-120	
Thallium	ug/L	100	97.0	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2826369 2826370

Parameter	Units	92370470001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6.8	100	100	106	109	100	103	75-125	3	20	
Lithium	ug/L	17.8	100	100	120	119	102	101	75-125	1	20	
Thallium	ug/L	ND	100	100	99.1	97.7	99	98	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 395724 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92370945001, 92370945002

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,1-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloropropane	ug/L	ND	1.0	01/26/18 22:26	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
2-Butanone (MEK)	ug/L	ND	5.0	01/26/18 22:26	
2-Hexanone	ug/L	ND	5.0	01/26/18 22:26	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/26/18 22:26	
Acetone	ug/L	ND	25.0	01/26/18 22:26	
Acrylonitrile	ug/L	ND	10.0	01/26/18 22:26	
Benzene	ug/L	ND	1.0	01/26/18 22:26	
Bromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromodichloromethane	ug/L	ND	1.0	01/26/18 22:26	
Bromoform	ug/L	ND	1.0	01/26/18 22:26	
Bromomethane	ug/L	ND	2.0	01/26/18 22:26	
Carbon disulfide	ug/L	ND	2.0	01/26/18 22:26	
Carbon tetrachloride	ug/L	ND	1.0	01/26/18 22:26	
Chlorobenzene	ug/L	ND	1.0	01/26/18 22:26	
Chloroethane	ug/L	ND	1.0	01/26/18 22:26	
Chloroform	ug/L	ND	1.0	01/26/18 22:26	
Chloromethane	ug/L	ND	1.0	01/26/18 22:26	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
Dibromochloromethane	ug/L	ND	1.0	01/26/18 22:26	
Dibromomethane	ug/L	ND	1.0	01/26/18 22:26	
Ethylbenzene	ug/L	ND	1.0	01/26/18 22:26	
Iodomethane	ug/L	ND	5.0	01/26/18 22:26	
Methylene Chloride	ug/L	ND	1.0	01/26/18 22:26	
Styrene	ug/L	ND	1.0	01/26/18 22:26	
Tetrachloroethene	ug/L	ND	1.0	01/26/18 22:26	
Toluene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:26	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/26/18 22:26	
Trichloroethene	ug/L	ND	1.0	01/26/18 22:26	

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

METHOD BLANK: 2193797 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/26/18 22:26	
Vinyl acetate	ug/L	ND	2.0	01/26/18 22:26	
Vinyl chloride	ug/L	ND	1.0	01/26/18 22:26	
Xylene (Total)	ug/L	ND	1.0	01/26/18 22:26	
1,2-Dichloroethane-d4 (S)	%	98	70-130	01/26/18 22:26	
4-Bromofluorobenzene (S)	%	97	70-130	01/26/18 22:26	
Toluene-d8 (S)	%	106	70-130	01/26/18 22:26	

LABORATORY CONTROL SAMPLE: 2193798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.2	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.6	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.2	102	79-124	
1,1,2-Trichloroethane	ug/L	50	51.4	103	85-125	
1,1-Dichloroethane	ug/L	50	49.3	99	73-126	
1,1-Dichloroethene	ug/L	50	53.1	106	66-135	
1,2,3-Trichloropropane	ug/L	50	52.5	105	75-130	
1,2-Dichlorobenzene	ug/L	50	48.9	98	80-133	
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	52.8	106	75-132	
1,4-Dichlorobenzene	ug/L	50	49.7	99	78-130	
2-Butanone (MEK)	ug/L	100	104	104	61-144	
2-Hexanone	ug/L	100	102	102	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	109	109	72-135	
Acetone	ug/L	100	115	115	48-146	
Acrylonitrile	ug/L	250	272	109	40-160	
Benzene	ug/L	50	51.7	103	80-125	
Bromochloromethane	ug/L	50	47.0	94	71-125	
Bromodichloromethane	ug/L	50	46.9	94	78-124	
Bromoform	ug/L	50	49.1	98	71-128	
Bromomethane	ug/L	50	43.9	88	40-160	
Carbon disulfide	ug/L	50	56.5	113	50-160	
Carbon tetrachloride	ug/L	50	44.4	89	69-131	
Chlorobenzene	ug/L	50	49.9	100	81-122	
Chloroethane	ug/L	50	53.6	107	39-148	
Chloroform	ug/L	50	44.9	90	73-127	
Chloromethane	ug/L	50	46.1	92	44-146	
cis-1,2-Dichloroethene	ug/L	50	49.8	100	74-124	
cis-1,3-Dichloropropene	ug/L	50	53.5	107	72-132	
Dibromochloromethane	ug/L	50	50.1	100	78-125	
Dibromomethane	ug/L	50	45.4	91	82-120	
Ethylbenzene	ug/L	50	49.8	100	79-121	
Iodomethane	ug/L	100	103	103	39-154	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

LABORATORY CONTROL SAMPLE: 2193798

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	50.6	101	84-126	
Tetrachloroethene	ug/L	50	49.2	98	78-122	
Toluene	ug/L	50	49.5	99	80-121	
trans-1,2-Dichloroethene	ug/L	50	51.8	104	71-127	
trans-1,3-Dichloropropene	ug/L	50	51.4	103	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	47.5	95	40-160	
Trichloroethene	ug/L	50	52.2	104	78-122	
Trichlorofluoromethane	ug/L	50	42.1	84	53-137	
Vinyl acetate	ug/L	100	95.9	96	40-160	
Vinyl chloride	ug/L	50	55.4	111	58-137	
Xylene (Total)	ug/L	150	152	101	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.3	97	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.2	116	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.5	108	70-130	
1,1-Dichloroethane	ug/L	ND	20	24.4	122	70-130	
1,1-Dichloroethene	ug/L	ND	20	26.0	130	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.5	107	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.1	106	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.1	105	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.5	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
2-Butanone (MEK)	ug/L	ND	40	40.3	101	70-130	
2-Hexanone	ug/L	ND	40	38.3	96	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	39.7	99	70-130	
Acetone	ug/L	ND	40	46.1	115	70-130	
Acrylonitrile	ug/L	ND	100	123	123	70-130	
Benzene	ug/L	ND	20	23.1	116	70-148	
Bromochloromethane	ug/L	ND	20	23.0	115	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	18.3	91	70-130	
Bromomethane	ug/L	ND	20	19.6	98	70-130	
Carbon disulfide	ug/L	ND	20	24.1	121	70-130	
Carbon tetrachloride	ug/L	ND	20	21.3	106	70-130	
Chlorobenzene	ug/L	ND	20	21.6	108	70-146	
Chloroethane	ug/L	ND	20	24.5	122	70-130	
Chloroform	ug/L	ND	20	21.0	105	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

MATRIX SPIKE SAMPLE: 2193799

Parameter	Units	92370470001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	23.2	115	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.7	118	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	20.4	102	70-130	
Dibromochloromethane	ug/L	ND	20	19.8	99	70-130	
Dibromomethane	ug/L	ND	20	19.5	97	70-130	
Ethylbenzene	ug/L	ND	20	22.4	112	70-130	
Iodomethane	ug/L	ND	40	48.7	122	70-130	
Methylene Chloride	ug/L	ND	20	23.3	117	70-130	
Styrene	ug/L	ND	20	21.5	108	70-130	
Tetrachloroethene	ug/L	ND	20	21.6	108	70-130	
Toluene	ug/L	ND	20	21.7	108	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	24.4	122	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	18.8	94	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	16.7	84	70-130	
Trichloroethene	ug/L	ND	20	23.2	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.3	112	70-130	
Vinyl acetate	ug/L	ND	40	31.7	79	70-130	
Vinyl chloride	ug/L	ND	20	26.1	130	70-130	
Xylene (Total)	ug/L	ND	60	67.0	112	70-130	
1,2-Dichloroethane-d4 (S)	%				99	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

SAMPLE DUPLICATE: 2193800

Parameter	Units	92370470002 Result	Dup Result	RPD	Max RPD	Qualifiers
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	.18J		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)	%	94	99	5		
4-Bromofluorobenzene (S)	%	97	97	0		
Toluene-d8 (S)	%	110	105	4		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 395725 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92370945003, 92370945004, 92370945005, 92370945006

METHOD BLANK: 2193801 Matrix: Water
Associated Lab Samples: 92370945003, 92370945004, 92370945005, 92370945006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:43	
1,1,1-Trichloroethane	ug/L	ND	1.0	01/26/18 22:43	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	01/26/18 22:43	
1,1,2-Trichloroethane	ug/L	ND	1.0	01/26/18 22:43	
1,1-Dichloroethane	ug/L	ND	1.0	01/26/18 22:43	
1,1-Dichloroethene	ug/L	ND	1.0	01/26/18 22:43	
1,2,3-Trichloropropane	ug/L	ND	1.0	01/26/18 22:43	
1,2-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:43	
1,2-Dichloroethane	ug/L	ND	1.0	01/26/18 22:43	
1,2-Dichloropropane	ug/L	ND	1.0	01/26/18 22:43	
1,4-Dichlorobenzene	ug/L	ND	1.0	01/26/18 22:43	
2-Butanone (MEK)	ug/L	ND	5.0	01/26/18 22:43	
2-Hexanone	ug/L	ND	5.0	01/26/18 22:43	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	01/26/18 22:43	
Acetone	ug/L	ND	25.0	01/26/18 22:43	
Acrylonitrile	ug/L	ND	10.0	01/26/18 22:43	
Benzene	ug/L	ND	1.0	01/26/18 22:43	
Bromochloromethane	ug/L	ND	1.0	01/26/18 22:43	
Bromodichloromethane	ug/L	ND	1.0	01/26/18 22:43	
Bromoform	ug/L	ND	1.0	01/26/18 22:43	
Bromomethane	ug/L	ND	2.0	01/26/18 22:43	
Carbon disulfide	ug/L	ND	2.0	01/26/18 22:43	
Carbon tetrachloride	ug/L	ND	1.0	01/26/18 22:43	
Chlorobenzene	ug/L	ND	1.0	01/26/18 22:43	
Chloroethane	ug/L	ND	1.0	01/26/18 22:43	
Chloroform	ug/L	ND	1.0	01/26/18 22:43	
Chloromethane	ug/L	ND	1.0	01/26/18 22:43	
cis-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:43	
cis-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:43	
Dibromochloromethane	ug/L	ND	1.0	01/26/18 22:43	
Dibromomethane	ug/L	ND	1.0	01/26/18 22:43	
Ethylbenzene	ug/L	ND	1.0	01/26/18 22:43	
Iodomethane	ug/L	ND	5.0	01/26/18 22:43	
Methylene Chloride	ug/L	ND	1.0	01/26/18 22:43	
Styrene	ug/L	ND	1.0	01/26/18 22:43	
Tetrachloroethene	ug/L	ND	1.0	01/26/18 22:43	
Toluene	ug/L	ND	1.0	01/26/18 22:43	
trans-1,2-Dichloroethene	ug/L	ND	1.0	01/26/18 22:43	
trans-1,3-Dichloropropene	ug/L	ND	1.0	01/26/18 22:43	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	01/26/18 22:43	
Trichloroethene	ug/L	ND	1.0	01/26/18 22:43	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

METHOD BLANK: 2193801 Matrix: Water
Associated Lab Samples: 92370945003, 92370945004, 92370945005, 92370945006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	01/26/18 22:43	
Vinyl acetate	ug/L	ND	2.0	01/26/18 22:43	
Vinyl chloride	ug/L	ND	1.0	01/26/18 22:43	
Xylene (Total)	ug/L	ND	1.0	01/26/18 22:43	
1,2-Dichloroethane-d4 (S)	%	99	70-130	01/26/18 22:43	
4-Bromofluorobenzene (S)	%	97	70-130	01/26/18 22:43	
Toluene-d8 (S)	%	103	70-130	01/26/18 22:43	

LABORATORY CONTROL SAMPLE: 2193802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	50.2	100	80-125	
1,1,1-Trichloroethane	ug/L	50	48.5	97	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	51.0	102	79-124	
1,1,2-Trichloroethane	ug/L	50	50.2	100	85-125	
1,1-Dichloroethane	ug/L	50	50.7	101	73-126	
1,1-Dichloroethene	ug/L	50	51.6	103	66-135	
1,2,3-Trichloropropane	ug/L	50	53.3	107	75-130	
1,2-Dichlorobenzene	ug/L	50	48.7	97	80-133	
1,2-Dichloroethane	ug/L	50	44.5	89	67-128	
1,2-Dichloropropane	ug/L	50	52.5	105	75-132	
1,4-Dichlorobenzene	ug/L	50	48.7	97	78-130	
2-Butanone (MEK)	ug/L	100	103	103	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	108	108	48-146	
Acrylonitrile	ug/L	250	278	111	40-160	
Benzene	ug/L	50	50.9	102	80-125	
Bromochloromethane	ug/L	50	49.1	98	71-125	
Bromodichloromethane	ug/L	50	46.8	94	78-124	
Bromoform	ug/L	50	48.8	98	71-128	
Bromomethane	ug/L	50	44.5	89	40-160	
Carbon disulfide	ug/L	50	54.3	109	50-160	
Carbon tetrachloride	ug/L	50	44.7	89	69-131	
Chlorobenzene	ug/L	50	49.5	99	81-122	
Chloroethane	ug/L	50	49.2	98	39-148	
Chloroform	ug/L	50	45.3	91	73-127	
Chloromethane	ug/L	50	47.4	95	44-146	
cis-1,2-Dichloroethene	ug/L	50	49.4	99	74-124	
cis-1,3-Dichloropropene	ug/L	50	53.3	107	72-132	
Dibromochloromethane	ug/L	50	50.3	101	78-125	
Dibromomethane	ug/L	50	46.1	92	82-120	
Ethylbenzene	ug/L	50	49.6	99	79-121	
Iodomethane	ug/L	100	98.9	99	39-154	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

LABORATORY CONTROL SAMPLE: 2193802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	49.6	99	64-133	
Styrene	ug/L	50	50.2	100	84-126	
Tetrachloroethene	ug/L	50	49.9	100	78-122	
Toluene	ug/L	50	48.5	97	80-121	
trans-1,2-Dichloroethene	ug/L	50	49.5	99	71-127	
trans-1,3-Dichloropropene	ug/L	50	50.9	102	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	48.6	97	40-160	
Trichloroethene	ug/L	50	50.8	102	78-122	
Trichlorofluoromethane	ug/L	50	41.6	83	53-137	
Vinyl acetate	ug/L	100	99.7	100	40-160	
Vinyl chloride	ug/L	50	53.1	106	58-137	
Xylene (Total)	ug/L	150	151	101	81-126	
1,2-Dichloroethane-d4 (S)	%			89	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			97	70-130	

MATRIX SPIKE SAMPLE: 2193803

Parameter	Units	92370945003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	19.7	98	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	22.4	112	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20.8	104	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.8	109	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.1	110	70-130	
1,1-Dichloroethene	ug/L	ND	20	25.7	128	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.9	110	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	20.4	102	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.3	107	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.4	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	20.9	104	70-130	
2-Butanone (MEK)	ug/L	ND	40	41.9	105	70-130	
2-Hexanone	ug/L	ND	40	39.3	98	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	42.9	107	70-130	
Acetone	ug/L	ND	40	49.4	123	70-130	
Acrylonitrile	ug/L	ND	100	117	117	70-130	
Benzene	ug/L	ND	20	23.1	116	70-148	
Bromochloromethane	ug/L	ND	20	22.4	112	70-130	
Bromodichloromethane	ug/L	ND	20	20.9	105	70-130	
Bromoform	ug/L	ND	20	19.1	95	70-130	
Bromomethane	ug/L	ND	20	17.0	85	70-130	
Carbon disulfide	ug/L	ND	20	25.4	127	70-130	
Carbon tetrachloride	ug/L	ND	20	20.6	103	70-130	
Chlorobenzene	ug/L	ND	20	21.9	109	70-146	
Chloroethane	ug/L	ND	20	26.4	132	70-130	M1
Chloroform	ug/L	ND	20	20.5	103	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

MATRIX SPIKE SAMPLE: 2193803

Parameter	Units	92370945003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	20	22.1	109	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.2	116	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	19.9	99	70-130	
Dibromochloromethane	ug/L	ND	20	20.8	104	70-130	
Dibromomethane	ug/L	ND	20	19.9	100	70-130	
Ethylbenzene	ug/L	ND	20	22.3	112	70-130	
Iodomethane	ug/L	ND	40	41.2	103	70-130	
Methylene Chloride	ug/L	ND	20	23.0	115	70-130	
Styrene	ug/L	ND	20	21.5	107	70-130	
Tetrachloroethene	ug/L	ND	20	22.2	111	70-130	
Toluene	ug/L	ND	20	21.3	106	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	24.5	122	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	14.5	73	70-130	
Trichloroethene	ug/L	ND	20	23.1	116	69-151	
Trichlorofluoromethane	ug/L	ND	20	22.4	112	70-130	
Vinyl acetate	ug/L	ND	40	32.0	80	70-130	
Vinyl chloride	ug/L	ND	20	25.7	128	70-130	
Xylene (Total)	ug/L	ND	60	66.3	111	70-130	
1,2-Dichloroethane-d4 (S)	%				96	70-130	
4-Bromofluorobenzene (S)	%				99	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 2193804

Parameter	Units	92370945004 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

SAMPLE DUPLICATE: 2193804

Parameter	Units	92370945004 Result	Dup Result	RPD	Max RPD	Qualifiers
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)	%	97	99	2		
4-Bromofluorobenzene (S)	%	96	99	3		
Toluene-d8 (S)	%	104	104	0		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 396124 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

METHOD BLANK: 2196073 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	01/31/18 10:15	

LABORATORY CONTROL SAMPLE: 2196074

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	232	93	90-110	

SAMPLE DUPLICATE: 2196075

Parameter	Units	92370945001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	246	252	2	5	

SAMPLE DUPLICATE: 2196076

Parameter	Units	92371012002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	45.0	33.0	31	5	D6

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 395973
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92370945001, 92370945002

METHOD BLANK: 2194996 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/30/18 12:20	
Fluoride	mg/L	ND	0.10	01/30/18 12:20	
Sulfate	mg/L	ND	1.0	01/30/18 12:20	

LABORATORY CONTROL SAMPLE: 2194997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	48.9	98	90-110	
Fluoride	mg/L	2.5	2.7	110	90-110	
Sulfate	mg/L	50	48.6	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2194998 2194999

Parameter	Units	92371045002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	120	50	50	168	171	95	101	90-110	2	10	
Fluoride	mg/L	ND	2.5	2.5	2.6	2.6	102	104	90-110	2	10	
Sulfate	mg/L	ND	50	50	50.7	52.3	101	105	90-110	3	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2195000 2195001

Parameter	Units	92370895003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	43.1	50	50	94.0	94.9	102	104	90-110	1	10	
Fluoride	mg/L	0.20	2.5	2.5	2.7	2.8	99	102	90-110	3	10	
Sulfate	mg/L	10.2	50	50	62.3	62.5	104	105	90-110	0	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 396127 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92370945003, 92370945004, 92370945005

METHOD BLANK: 2196091 Matrix: Water
Associated Lab Samples: 92370945003, 92370945004, 92370945005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/31/18 20:36	
Fluoride	mg/L	ND	0.10	01/31/18 20:36	
Sulfate	mg/L	ND	1.0	01/31/18 20:36	

LABORATORY CONTROL SAMPLE: 2196092

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	2.5	102	90-110	
Sulfate	mg/L	50	52.7	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2196093 2196094

Parameter	Units	92370945003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1180	50	50	1200	1230	30	89	90-110	2	10	M6
Fluoride	mg/L	0.28	2.5	2.5	2.9	3.0	107	107	90-110	0	10	
Sulfate	mg/L	73.3	50	50	118	124	90	101	90-110	5	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2196095 2196096

Parameter	Units	92371121002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	35.1	50	50	86.3	87.3	102	104	90-110	1	10	
Fluoride	mg/L	0.14	2.5	2.5	2.8	2.9	107	109	90-110	2	10	
Sulfate	mg/L	27.0	50	50	79.9	81.0	106	108	90-110	1	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-5 **Lab ID: 92370945001** Collected: 01/25/18 09:55 Received: 01/26/18 06:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.153 ± 0.475 (0.919) C:NA T:85%**	pCi/L	02/06/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**-0.0690 ± 0.392 (0.914) C:74% T:87%**	pCi/L	02/05/18 14:43	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-1 **Lab ID: 92370945002** Collected: 01/25/18 15:00 Received: 01/26/18 06:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.225 ± 0.442 (0.808) C:NA T:89%**	pCi/L	02/06/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**0.537 ± 0.330 (0.613) C:76% T:94%**	pCi/L	02/05/18 14:44	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: MW-2 **Lab ID: 92370945003** Collected: 01/25/18 17:20 Received: 01/26/18 06:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.648 ± 0.706 (1.11) C:NA T:78%**	pCi/L	02/06/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**0.716 ± 0.398 (0.711) C:76% T:88%**	pCi/L	02/05/18 14:44	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: AMB **Lab ID: 92370945004** Collected: 01/25/18 11:30 Received: 01/26/18 06:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.256 ± 0.555 (1.02) C:NA T:82%**	pCi/L	02/06/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**-0.0230 ± 0.423 (0.981) C:76% T:72%**	pCi/L	02/05/18 14:44	15262-20-1	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Sample: EQB **Lab ID: 92370945005** Collected: 01/25/18 15:30 Received: 01/26/18 06:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.336 ± 0.386 (0.228) C:NA T:79%**	pCi/L	02/06/18 18:52	13982-63-3	
Radium-228	EPA 904.0	**0.240 ± 0.334 (0.715) C:81% T:78%**	pCi/L	02/05/18 14:44	15262-20-1	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 286667 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

METHOD BLANK: 1405826 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.261 ± 0.301 (0.631) C:83% T:85%	pCi/L	02/05/18 14:43	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

QC Batch: 286666 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

METHOD BLANK: 1405825 Matrix: Water
Associated Lab Samples: 92370945001, 92370945002, 92370945003, 92370945004, 92370945005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.083 ± 0.380 (0.773) C:NA T:85%	pCi/L	02/06/18 18:23	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

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.

TNTC - Too Numerous To Count

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.

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

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.

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92370945

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92370945001	**MW-5**	EPA 3010A	395740	EPA 6010	395781
92370945002	**MW-1**	EPA 3010A	395740	EPA 6010	395781
92370945003	**MW-2**	EPA 3010A	395740	EPA 6010	395781
92370945004	**AMB**	EPA 3010A	395740	EPA 6010	395781
92370945005	**EQB**	EPA 3010A	395740	EPA 6010	395781
92370945001	**MW-5**	EPA 3020	520509	EPA 6020B	520912
92370945002	**MW-1**	EPA 3020	520509	EPA 6020B	520912
92370945003	**MW-2**	EPA 3020	520509	EPA 6020B	520912
92370945004	**AMB**	EPA 3020	520509	EPA 6020B	520912
92370945005	**EQB**	EPA 3020	520509	EPA 6020B	520912
92370945001	**MW-5**	EPA 7470	395798	EPA 7470	395820
92370945002	**MW-1**	EPA 7470	395798	EPA 7470	395820
92370945003	**MW-2**	EPA 7470	395798	EPA 7470	395820
92370945004	**AMB**	EPA 7470	395798	EPA 7470	395820
92370945005	**EQB**	EPA 7470	395798	EPA 7470	395820
92370945001	**MW-5**	EPA 8260	395724		
92370945002	**MW-1**	EPA 8260	395724		
92370945003	**MW-2**	EPA 8260	395725		
92370945004	**AMB**	EPA 8260	395725		
92370945005	**EQB**	EPA 8260	395725		
92370945006	**TRIP BLANK**	EPA 8260	395725		
92370945001	**MW-5**	EPA 903.1	286666		
92370945002	**MW-1**	EPA 903.1	286666		
92370945003	**MW-2**	EPA 903.1	286666		
92370945004	**AMB**	EPA 903.1	286666		
92370945005	**EQB**	EPA 903.1	286666		
92370945001	**MW-5**	EPA 904.0	286667		
92370945002	**MW-1**	EPA 904.0	286667		
92370945003	**MW-2**	EPA 904.0	286667		
92370945004	**AMB**	EPA 904.0	286667		
92370945005	**EQB**	EPA 904.0	286667		
92370945001	**MW-5**	SM 2540C	396124		
92370945002	**MW-1**	SM 2540C	396124		
92370945003	**MW-2**	SM 2540C	396124		
92370945004	**AMB**	SM 2540C	396124		
92370945005	**EQB**	SM 2540C	396124		
92370945001	**MW-5**	EPA 300.0	395973		
92370945002	**MW-1**	EPA 300.0	395973		
92370945003	**MW-2**	EPA 300.0	396127		
92370945004	**AMB**	EPA 300.0	396127		
92370945005	**EQB**	EPA 300.0	396127		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: January 24, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.05	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt Client Name: HDR Project #

WO# : 92370945

92370945

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☑ No

Date/Initials Person Examining Contents: LB 1/26/18

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☑ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer: ☐ IR Gun ID: T1704

Type of Ice: ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 2.7, 3.3 Correction Factor: Add/Subtract (°C) +0.1

Cooler Temp Corrected (°C): 2.8, 3.4

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☑ No	☐ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: LSG 1-26-18 WT	☑ Yes	☑ No	☐ N/A	9. Trip Blank present not on CoC
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: _____ Date: _____

Project Manager SRF Review: _____ Date: _____

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

**Bottom half of box is to list number of bottle

Project # WO#: 92370945

PM: KLH1 Due Date: 02/02/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN RAPS
1		1	1			2										3													3
2		1	1			2										3													3
3		1	1			2										3													2
4		1	1			2										3													3
5		1	1			2										3													3
6																4													
7																													
8																													
9																													
10																													
11																													
12																													

TB

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

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

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
Charlotte, NC 28202				Address:	
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone:	(704)248-3632 Fax:	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1

Regulatory Agency: | State / Location: NC

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260	300.0-Cl, F, Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	92370945
1	MW-5	WT	G			1/25/18	955	6.6	10	2		5	3						3	1	1	3	1	1			001
2	MW-1	WT	G			1/25/18	1500		10	2		5	3						3	1	1	3	1	1			002
3	MW-2	WT	G			1/25/18	1720	12.2	9	2		4	3						3	1	1	2	1	1			003
4																											
5	AMB	WT	G			1/25/18	1130		10	2		5	3						3	1	1	3	1	1			004
6	EQB	WT	G			1/25/18	1530		10	2		5	3						3	1	1	3	1	1			005
7																											MW-TB
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jesse Allred PACE	1-26-18	0630	Kelly Brown PACE	1-26-18	630	2.7 / 3.3	Y	W	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: JESSE ALLRED

SIGNATURE of SAMPLER: Jesse Allred DATE Signed: 1-25-18

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

C

Appendix C – Electronic Data Deliverables (CD-ROM only)

This page intentionally left blank.

D

Appendix D – Statistical Analysis Memo

This page intentionally left blank.

Memo

Date:	Wednesday, April 18, 2018
To:	Charah, LLC
From:	HDR Engineering, Inc.
Subject:	Summary of Statistical Analysis and Evaluation for SSIs Charah, LLC Brickhaven No. Mine Tract 'A' Site MSWFL Groundwater Monitoring Network

The Charah, LLC Brickhaven No. Mine Tract 'A' Site (Brickhaven Mine) is operating under the Facility Permit #1910-STRUC-2015 as a municipal solid waste land fill (MSWLF). As required by Section .1600 rules of the North Carolina Solid Waste Management Rules 15A NCAC 13B .1633, the owner or operator of a MSWLF facility shall accurately establish background groundwater quality for the detection monitoring program and determine if a statistically significant increase (SSI) over background has occurred in downgradient monitoring wells. This memorandum reports on the statistically-derived background threshold values (BTVs) for the Appendix I metals, and Appendix III and Appendix IV constituents, and summarizes the results of testing for SSIs for the constituents collected during the detection monitoring rounds at designated in-network downgradient monitoring wells.

The statistical analysis was performed in accordance with the methods described in the Section .1600 rules of the North Carolina Solid Waste Management Rules for the Brickhaven Mine. Sampling results used to establish BTVs were obtained during thirteen monitoring events performed between August 2015 and January 2018. Downgradient sampling results from the first detection monitoring round in January 2018 were used to evaluate for SSIs. The calculated BTVs and the evaluation for SSIs over background for the Appendix I metals, Appendix III and Appendix IV constituents are provided in Table 1 and 2, respectively.

Table 1: Summary of Evaluation for SSIs over Background for Appendix I Metals (Detection Monitoring)

	Appendix I Metals				
	Copper	Nickel	Silver	Vanadium	Zinc
Unit	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
BTV (UPL)	2.50	2.50	2.50	6.00	10.0
Well	*First Detection Monitoring Round Results*				
MW-1	2.50	**13.3**	2.50	2.50	**16.1**
MW-2	**6.60**	**33.8**	2.50	2.50	5.00
MW-3	**5.60**	2.50	2.50	2.50	5.00
MW-4	2.50	**6.90**	2.50	2.50	5.00
MW-5	**6.90**	**9.00**	2.50	2.50	5.00
MW-6	2.50	2.50	2.50	2.50	5.00
MW-7	2.50	2.50	2.50	2.50	5.00
MW-8	**10.2**	**13.8**	2.50	2.50	5.00

Notes:
Bold and underlined concentration indicates an SSI over background.

Table 2: Summary of Evaluation for SSIs over Background for Appendix III Constituents (Detection Monitoring)

	Appendix III Constituents						
	Boron	Calcium	Chloride	Fluoride	pH (Field)	Sulfate	TDS
Unit	**ug/L**	**ug/L**	**mg/L**	**mg/L**	**S.U.**	**mg/L**	**mg/L**
BTV (UPL)	14.7	36,894	318	0.155	6.03 - 7.07*	23.2	2,630
Well	*First Detection Monitoring Round Results*						
MW-1	6.20	**146,000**	**547**	0.120	6.70	6.60	1,020
MW-2	**40.7**	**182,000**	**1,180**	**0.280**	**7.60**	**73.3**	2,300
MW-3	**16.6**	**169,000**	**987**	**0.460**	**7.50**	**102**	1,060
MW-4	1.50	**66,700**	**492**	**0.320**	6.50	12.3	1,210
MW-5	11.2	15,100	19.7	**0.680**	**7.20**	5.30	246
MW-6	5.40	33,900	229	**0.490**	7.00	**107**	774
MW-7	**22.7**	**53,200**	**382**	**0.210**	6.80	11.2	1,100
MW-8	10.1	**100,000**	**390**	0.0500	**7.20**	8.00	1,020

Notes:
Bold and underlined concentration indicates an SSI over background.
* indicates the lower bound of the pH range is the LPL. The upper bound is the UPL.

Table 3: Summary of Evaluation for SSIs over Background for Appendix IV Constituents (Detection Monitoring)

	Appendix IV Constituents								
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Fluoride**	**Lead**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L
BTV (UPL)	3.90	5.00	434	0.500	0.500	2.50	2.50	0.155	2.50
Well	*First Detection Monitoring Round Results*								
MW-1	3.90	5.00	175	0.500	0.500	**18.4**	2.50	0.120	2.50
MW-2	**6.90**	5.00	314	0.500	0.500	**56.8**	2.50	**0.280**	2.50
MW-3	**5.80**	5.00	**570**	0.500	0.500	**5.30**	2.50	**0.460**	2.50
MW-4	3.90	5.00	300	0.500	0.500	**5.70**	2.50	**0.320**	2.50
MW-5	3.90	5.00	123	0.500	0.500	**15.3**	2.50	**0.680**	2.50
MW-6	3.90	5.00	99.5	0.500	0.500	2.50	2.50	**0.490**	2.50
MW-7	3.80	2.50	224	0.500	0.500	2.50	2.50	**0.210**	2.50
MW-8	3.90	5.00	**1,210**	0.500	0.500	**25.3**	2.50	0.0500	2.50

	Lithium	**Mercury**	**Moly-bdenum**	**Radium-226**	**Radium-228**	**Selenium**	**Thallium**	**Total Radium**
Unit	ug/L	ug/L	ug/L	pCi/L	pCi/L	ug/L	ug/L	pCi/L
BTV (UPL)	36.8	0.100	6.80	0.802	2.39	5.00	13.7	2.39
Well	*First Detection Monitoring Round Results*							
MW-1	33.3	0.100	2.50	0.225	0.537	5.00	0.0300	0.762
MW-2	**96.6**	0.100	**7.10**	0.648	0.716	5.00	0.0300	1.36
MW-3	**90.2**	0.100	**6.90**	**1.21**	1.08	5.00	0.0300	2.29
MW-4	28.6	0.100	2.50	0.00	0.710	5.00	0.0300	0.710
MW-5	7.10	0.100	2.50	0.153	-0.0690	5.00	0.0300	0.153
MW-6	**41.9**	0.100	2.50	0.278	0.874	5.00	0.0300	1.15
MW-7	23.0	0.100	2.50	0.00	0.0190	5.00	5.00	0.0190
MW-8	25.3	**0.370**	2.50	0.298	0.427	5.00	0.0300	0.725

Notes:
Bold and underlined concentration indicates an SSI over background

This page intentionally left blank.



HDR Engineering, Inc. of the Carolinas
440 S Church Street, Suite 1000
Charlotte, NC 28202-2075
704.338.6700
NC License F0116

hdrinc.com

© 2018 HDR, Inc., all rights reserved

B

Attachment B – 2018 Second Semi-Annual Detection Monitoring Report

2018 Second Semi-Annual Detection Monitoring Report

Brickhaven No.2 Mine Tract "A" Structural Fill

Charah Solutions, Inc.

Moncure, Chatham County, North Carolina

November 2018

HDR Engineering, Inc. of the Carolinas
440 S Church Street, Suite 1000, Charlotte, NC 28202-2075
704.338.6700
NC License F0116

This page intentionally left blank.

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 Meadow - Charah Solutions, Inc.

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

Name: Mark Filardi, PG Phone: 704-338-6787

E-mail: mark.filardi@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Charah Solutions, Inc. Brickhaven No. 2 Mine Tract 'A'	1271 Moncure-Flatwood Rd. Chatham County Moncure, North Carolina	1910- STRUC-2015	CAMA	July 16-19, 2018

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.

Mark Filardi, PG — Senior Geologist — 704-338-6787

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

Signature — 1/2/2019 — Date

Affix NC Licensed Professional Geologist Seal



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

This page intentionally left blank.

Table of Contents

1 Introduction 1
1.1 Purpose 1
1.2 Regulatory Compliance 1
1.3 Site Location and Operation 1
1.4 Groundwater Monitoring System 2
1.5 Site Topography and Geographical Setting 4
1.6 Geologic and Hydrogeologic Setting 4
1.6.1 Regional Geology 4
1.6.2 Site Geology 4
1.6.3 Regional Hydrogeology 6
2 Groundwater Flow Characteristics 7
2.1.1 Groundwater Flow Direction 9
2.1.2 Hydraulic Conductivity 9
2.1.3 Horizontal Hydraulic Gradients 9
2.1.4 Groundwater Flow Velocity 10
3 Sampling Procedures 11
3.1 Groundwater Sampling Procedures 11
3.2 Surface Water Sampling Procedures 11
3.3 Leachate Sampling Procedures 12
4 Water Quality 13
4.1 Background Site Conditions 13
4.2 Groundwater Analytical Results 14
4.3 Surface Water Analytical Results 17
4.4 Leachate Analytical Results 17
5 Statistics 18
5.1 Methodology 18
5.1.1 Statistical Analysis 18
5.1.2 Outliers 19
5.1.3 Data Distribution 19
5.1.4 Trends 19
5.2 Evaluation for SSIs over Background 20
5.3 Statistical Summary 24
6 Conclusions 25
6.1 Groundwater 25
6.2 Surface Water 25
6.3 Leachate 25
6.4 Statistical Analysis 26
6.5 Overall Summary 26
7 Recommendations 27
8 References 28

List of Tables

Table 1: Well Construction, Survey, and Groundwater Elevations 3
Table 2: Historic Groundwater Elevations 8
Table 3: Hydraulic Conductivity 9
Table 4: Horizontal Hydraulic Gradients (i, dh/dl) 10
Table 5: Analyte Detections and Exceedances - July 2018 15
Table 6: Summary of Evaluations for SSIs over Background for January 2018 and July 2018 21

Figures

Figure 1: Regional Site Location Map
Figure 2: Regional USGS Topographic Map
Figure 3: Site Layout Map with Monitoring Well Locations
Figure 4: Potentiometric Surface Map – July 2018
Figure 5: Surface Water Sample Location Map
Figure 6: Leachate Sample Collection Location

Appendices

Appendix A – Field Data Sheets
Appendix B – Concentration vs. Time Plots
Appendix C – Laboratory Reports, Chains of Custody, & Quality Control Data
Appendix D – Electronic Data Deliverables (CD-ROM only)
Appendix E – Statistical Analysis Memo

List of Select Acronyms

µg/L	micrograms per liter
bMDL	below Method Detection Limit
CAMA	North Carolina Coal Ash Management Act of 2014
CCP	Coal Combustion Products
DEC	Duke Energy Carolinas
DEP	Duke Energy Progress
DO	Dissolved Oxygen
EDD	Electronic Data Deliverable
EPA	United States Environmental Protection Agency
ft./ft.	feet / foot
ID	Inner Diameter
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
NCGPS	North Carolina groundwater protection standard
N	Standard Penetration Resistance
ND	Non-detects
NPPL	Non-parametric Prediction Limit
NTU	Nephelometric turbidity units
MCL	Maximum Contaminant Levels
MDL	Method Detection Limit
msl	mean sea level
OD	Outer Diameter
ORP	Oxidation-Reduction Potential
PL	Predictive Limit
PPL	Parametric Prediction Limit
RCRA	Resource Conservation and Recovery Act
ROS	Regression on Order Statistics
SSI	Statistically Significant Increase
UPL	Upper Prediction Limit
USCS	United Soil Classification System

This page intentionally left blank.

1 Introduction

1.1 Purpose

This *2018 Second Semi-Annual Detection Monitoring Report* addresses the semi-annual detection monitoring at the Brickhaven No.2 Mine Tract "A" Structural Fill site in Moncure, Chatham County, North Carolina. The report includes results from the July 16-19, 2018 semi-annual detection monitoring event, as well as the statistical results calculated for this monitoring event.

The next semi-annual monitoring event will take place in January 2019.

1.2 Regulatory Compliance

Groundwater monitoring and sampling at the site is governed by the following:

- North Carolina - Coal Ash Management Act (CAMA) of 2014 (Senate Bill 729).
- Water Quality Monitoring Plan, Brickhaven No.2 Mine Tract "A" Structural Fill, approved March 2015 (Buxton, 2015a).
- North Carolina Department of Environment and Natural Resources (NCDENR)[1] Permit No. 1910-STRUC-2015, issued June 5, 2015.
- NCDENR Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling, April 2008 including Groundwater Rules .1600.
- NCDENR 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.

Groundwater monitoring and sampling at the site is also conducted in general accordance with the U.S. EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" rule (CCR Rule).

1.3 Site Location and Operation

The site is located in Chatham County, approximately four miles southeast of Moncure, North Carolina (**Figure 1**). The owner of the site is Green Meadow, LLC (Green Meadow). Charah Solutions, Inc. (Charah) is responsible for the operation and maintenance of the site. The mine property is approximately 301 acres in total; of which 145 acres is permitted for structural fill placement of coal combustion products (CCP).

The property located within the structural fill area was previously owned by General Shale Brick, Inc., which operated the site and an adjacent property as a clay mine beginning in 1985 for their

[1] On September 18, 2015, the North Carolina Department of Environment and Natural Resources (NCDENR) became the North Carolina Department of Environmental Quality (NCDEQ). Both naming conventions are used in this report, as appropriate.

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 (October 2015), municipal water is available to the surrounding area.

Charah began CCP placement in the first composite liner containment system (Cell 1, Sub Cell 1A) on October 23, 2015. CCP placement has occurred in Cell 1, Cell 2, Cell 6A and Cell 6B. Charah has placed just over 6 million tons of CCP material in the structural fill at the time of this report. CCP materials (including fly ash, bottom ash, boiler slag, and/or flue gas desulfurization materials) were initially brought to the site by truck through October 2015 until transportation was changed to rail in January 2016. The CCP originated at the Duke Energy Carolinas (DEC) Riverbend Steam Station and Duke Energy Progress (DEP) L.V. Sutton Energy Complex (Sutton Plant) sites. CCP could eventually be brought to the site from other DEC and/or DEP sites in North Carolina.

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 the collection, storage, and disposal of the resultant liquid. Green Meadow has approved pump and haul permits to dispose of leachate at the City of Sanford's Big Buffalo Creek Wastewater Treatment Plant and the Town of Spring Lake's South Harnett Regional Wastewater Treatment Plant.

1.4 Groundwater Monitoring System

The groundwater monitoring system was designed to provide background groundwater quality data prior to the placement of CCP in the structural fill and early detection of potential CCP constituents subsequent to CCP placement to be protective of human health and the environment. The groundwater monitoring system is comprised of nine (9) wells: eight wells are located downgradient/side-gradient (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7R and MW-8) and one well is considered to represent background groundwater quality (BG-1). Well construction details are summarized in Table 1.

Background monitoring well BG-1 was installed in July of 2015 near the entrance of the site along Moncure-Flatwood Road. This location was selected to provide groundwater quality data in an area of the site presumed to not be impacted by historic or current usage of the site.

MW-7R was installed in April of 2017 as a replacement for monitoring well MW-7 as documented and approved in the May 25, 2017 memorandum to NCDEQ - Solid Waste Section. MW-7 will temporarily remain onsite for water level gauging purposes only.

Table 1: Well Construction, Survey, and Groundwater Elevations

Well ID	Northing	Easting	Pad Elev.	TOC Elev.	TD (ft. BGS)	TD (ft. BTOC)	Screen Length (ft.)	Screened Interval (ft. BGS)	DTW (ft. BTOC)	GW Elevation	Lithologic Unit
BG-1	670898.50	1996348.25	225.64	228.19	40.50	43.05	15	26-41	12.82	215.37	Layered Rock/PWR*
MW-1	674737.98	1993417.69	277.28	280.08	72.50	75.30	15	57-72	62.05	218.03	Layered Rock/PWR*
MW-2	673677.07	1994537.54	229.27	231.76	47.66	50.15	15	30-45	36.11	195.65	Layered Rock/PWR*
MW-3	672474.63	1994834.76	220.00	222.56	40.80	43.36	15	25-40	28.18	194.38	PWR
MW-4	671326.48	1994974.40	214.49	217.13	22.70	25.34	10	13-23	13.70	203.43	Residuum/PWR
MW-5	671081.19	1993779.03	242.72	244.86	44.00	46.14	10	34-44	22.93	221.93	PWR
MW-6	671267.60	1992793.34	228.63	231.10	27.00	29.47	15	12-27	8.89	222.21	Residuum/PWR
MW-7	672306.28	1992642.35	229.53	231.71	15.00	17.18	10	5-15	15.74	215.97	Residuum/PWR
MW-7R	672221.96	1992702.98	239.99	242.22	36.00	39.94	10	26-36	21.92	220.30	Residuum/PWR
MW-8	673304.83	1992200.37	233.41	236.47	46.00	49.06	15	31-46	38.02	198.45	PWR

Notes:

1. Top-of-casing, ground surface elevations and horizontal locations at MW-4 (PZM-1), MW-5 (PZM-22) and MW-7 (PZM-27) surveyed by Lawrence Surveying of Monroe, NC.
2. Top-of-casing, ground surface elevations and horizontal locations at BG-1, MW-1, MW-3, MW-6, MW-8 and MW-7R surveyed by McAdams of Durham, NC.
3. Top-of-casing, ground surface and horizontal location at monitoring well MW-2 surveyed by Gregory C. Bewley.
4. TD=total depth; BGS=below ground surface; TOC=top of casing; DTW = Depth-to-Water; BTOC = below top-of-casing; GW = groundwater.
5. Depth to water measurements obtained on July 16, 2018, to the nearest 0.01 foot with a water level meter by Pace Analytical Services, LLC.
6. Based on NAD 83 NGVD88.
7. * = interpreted lithologic unit based on relative drilling hardness and geologic judgment during well installation.

1.5 Site Topography and Geographical Setting

Based on review of the 1993 USGS topographic quadrangle (**Figure 2**) and GIS mapping, the topography of the site and immediately surrounding area can be characterized by moderately rolling hills, which are dissected by dendritic creeks. Prior to mining by General Shale, a topographic ridge was present within the site, extending from the northwestern corner of the present-day structural fill toward the southeast. Thus, historic drainage was to the north/northwest/west and to the northeast/east/southeast away from the ridge, as shown on **Figure 3**.

1.6 Geologic and Hydrogeologic Setting

1.6.1 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 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 faults 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 range 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 competent bedrock (Buxton, 2014).

1.6.2 Site Geology

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

of MW-4. Flood plain sediments were only identified at MW-4 on the southeast corner of the site. The following summary of site-specific units is based on boring logs originally included in the *Design Hydrogeologic Report* (Buxton, March 2016).

FILL

The fill materials were primarily identified in the road bed and berm located around the east and west sides near MW-4 and generally consisted of mottled reddish yellow, orange, brown, and light gray sandy silty clay with quartz and brick gravel.

FLOOD PLAIN

Flood plain sediments were only located adjacent to MW-4 on the southeast corner of the site. The sediments were associated with a former adjacent intermittent tributary creek and can be generally characterized as mottled light gray fine sandy silty clay. The flood plain sediments were approximately 5 feet thick in this area and had been deposited above residuum. Based on geotechnical laboratory data, the flood plain sediments were identified as lean clay (CL) under the United Soil Classification System (USCS).

SOIL HORIZON

The soil horizon can generally be characterized as mottled yellowish, brown, orange, and red silty clay and clayey silt. Root structures were common. The soil horizon at the site is formed from the continued weathering and biologic reworking of residuum, and ranges from 2 to 15 feet in thickness, when present. Based on geotechnical laboratory data, the soil horizon consisted of clayey sand (SC), elastic silt (MH), and lean clay (CL) and had a hydraulic conductivity of 2.86 x 10^{-7} cm/sec.

RESIDUUM

The residuum can generally be characterized as mottled (black and gray) red and reddish brown sandy silty clay with infrequent quartz gravel and cobbles. The residuum is characteristically fissile, often breaking 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 5 to 15 feet in thickness. The residuum has a Standard Penetration Resistance (N) of less than 100 blows per foot. Based on geotechnical laboratory data, the residuum consisted of lean clay (CL) with hydraulic conductivity ranging from 7.69 x 10^{-8} cm/sec to 3.69 x 10^{-9} cm/sec.

PARTIALLY WEATHERED ROCK

The partially weathered rock can generally be characterized as mottled (light green and purple) brown, reddish gray, and weak red silty clay and weathered mudstone, which are often fissile. The partially weathered rock generally retains the remnant texture, structure, and mineral content of the rock from which it was formed, and ranges from 5 to 40 feet in thickness. Partially weathered rock has an N-value 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 lean clay (CL). Hydraulic conductivity ranged from 2.433 x 10^{-4} cm/sec to 7.154 x 10^{-8} cm/sec, according to slug or recovery test data (for wells screened solely in partially weathered rock).

LAYERED ROCK

Based on rock coring activities conducted near MW-7/MW-7R and visual inspection of the layered rock exposed on the north side of the MW-4 area, 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 occurs as 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 contained horizontal to near vertical fracturing. Large fractures, oriented approximately N 40º to 60º E at 70 º northwest, were observed in weathered mudstone to the immediate northeast near MW-8. Rock Quality Designation (RQD) values for the MW-8 area rock core (21-inch recovery) were poor (47.6%). The occurrence of layered rock at the site was generally defined by auger refusal.

1.6.3 Regional Hydrogeology

The occurrence and movement of groundwater in the Piedmont physiographic province are 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 rock grains. 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 are 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.

2 Groundwater Flow Characteristics

Prior to this sampling event, a synoptic groundwater gauging round occurred to establish depth-to-water below top of casing for the nine monitoring wells sampled, as well as MW-7. Depths-to-water were measured on July 16, 2018 and ranged from 8.89 feet (MW-6) to 62.05 feet below top of casing (MW-1). Groundwater elevations ranged from 194.38 feet in well MW-3 to 222.21 feet in well MW-6 (Table 1). Historic groundwater elevations are shown in Table 2. Monitoring well locations are shown on **Figure 3**.

Table 2: Historic Groundwater Elevations

Well ID	TOC Elev.	Groundwater Elevation												
		Aug-15	*Oct-15*	*Nov-15*	*Jan-16*	*Feb-16*	*Apr-16*	*Jun-16*	*Jul-16*	*Jan-17*	*Apr-17*	*Jul-17*	*Jan-18*	*Jul-18*
BG-1	228.19	216.31	215.70	216.83	218.14	218.94	218.46	218.46	218.74	217.08	216.61	216.76	211.96	215.37
MW-1	280.08	220.04	220.18	220.55	222.03	222.76	221.83	221.83	221.51	220.58	219.72	219.19	217.61	218.03
MW-2	229.97	191.78	190.20	192.90	197.19	198.82	201.17	201.17	204.62	205.42	201.63	201.58	186.33	195.65
MW-3	222.56	207.62	208.46	210.29	210.64	212.31	212.36	212.36	204.81	202.35	202.36	203.91	199.53	194.38
MW-4	217.13	205.53	206.37	206.83	206.98	211.36	208.34	208.34	205.66	203.67	203.30	204.10	202.16	203.43
MW-5	244.86	232.01	229.66	230.11	230.16	228.69	220.06	220.06	222.96	203.32	221.53	222.60	218.86	221.93
MW-6	231.1	223.31	223.99	223.97	224.53	224.75	224.13	224.13	224.07	224.54	223.31	223.58	222.14	222.21
MW-7	231.71	223.45	222.36	222.53	216.11	215.31	215.66	215.65	216.21	215.42	215.59	216.09	215.03	215.97
MW-7R	242.22	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	220.92	217.54	220.30
MW-8	236.47	199.98	200.58	201.35	200.60	200.55	199.49	199.49	199.82	199.31	199.11	198.98	198.75	198.45

Notes:
1. NG – Not Gauged (MW-7R installed April 2017)

2.1.1 Groundwater Flow Direction

Groundwater flow at the site is generally dictated by a historic northwest to southeast trending topographic ridge that was present prior to mine development by General Shale and the presence of the Cape Fear River to the west and Shearon Harris Reservoir to the east. Thus, groundwater generally flows toward the eastern portion of the site, with the exception of the northwest section of the site in which groundwater is flowing generally to the west (**Figure 4**). Groundwater elevations and general flow directions remain consistent with previous background and detection monitoring events.

2.1.2 Hydraulic Conductivity

Horizontal hydraulic conductivity of aquifer materials adjacent to the well screen were estimated through in-situ slug testing during the *Design Hydrogeologic Report* (Buxton, 2016). Results are provided in Table 3.

Table 3: Hydraulic Conductivity

Well ID	Screen Length (ft)	Screened Interval (ft)	Estimated Effective Porosity (%)	Hydraulic Conductivity (K, cm/sec)	Lithologic Unit
BG-1	15	26-41	0.075	7.76E-05	Layered Rock/PWR*
MW-1	15	57-72	0.075	4.11E-04	Layered Rock/PWR*
MW-2	15	30-45	0.05	3.41E-06	Layered Rock/PWR*
MW-3	15	25-40	0.05	4.08E-07	PWR
MW-4	10	13-23	0.14	1.41E-04	Residuum/PWR
MW-5	10	34-44	0.075	8.01E-06	PWR
MW-6	15	12-27	0.15	1.10E-04	Residuum/PWR
MW-7	10	5-15	0.15	1.26E-06	Residuum/PWR
MW-8	15	26-36	0.075	1.29E-04	PWR

Notes:
1. 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).
2. Effective porosity values from geotechnical testing and the literature (McWhorter and Sunada, 1977; Sinhal and Gupta, 2010) where geotechnical data was not available.
3. MW-7R was installed after the Hydrogeologic Report was submitted and MW-7 was utilized for evaluation.
4. * = interpreted lithologic unit based on relative drilling hardness during well installation.

2.1.3 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. Hydraulic gradients at the site during this sampling event are depicted in Table 4.

Table 4: Horizontal Hydraulic Gradients (i, dh/dl)

Upgradient Well	Downgradient Well	Upgradient Groundwater Elevation (ft)	Downgradient Groundwater Elevation (ft)	Linear Flow Distance (ft)	Hydraulic Gradient
MW-1	MW-2	218.03	195.65	1,542	0.015
MW-5	MW-3	221.93	194.38	1,748	0.016

Notes:
1. Positive horizontal hydraulic gradients calculated by dividing the difference in hydraulic head between a well pair by the length 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 elevation and horizontal location for well MW-5 surveyed by Lawrence Surveying of Monroe, NC.
5. Top-of-casing elevations and horizontal locations for wells MW-1 and MW-3 surveyed by McAdams of Durham, NC.
6. Top-of-casing elevation and horizontal location for well MW-2 surveyed by Gregory C. Bewley.
7. Groundwater elevations calculated for depth-to-water measurements recorded on July 16, 2018.

2.1.4 Groundwater Flow Velocity

The average linear velocity, or seepage velocity, of groundwater between wells at the site was calculated using Darcy's Law, as follows:

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

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, as referenced above, and average horizontal hydraulic conductivity and estimated effective porosity values from geotechnical testing and from the literature where geotechnical data was not available (Buxton, 2014; Sinhal and Gupta, 2010).

Seepage velocity varies on a well-by-well basis and was calculated between the MW-1/MW-2 and MW-3/MW-5 well pairs, representing the two well pairs that are roughly perpendicular to the direction of groundwater flow. Seepage velocity was calculated at 1.11 feet per year (between MW-3 and MW-5) and 51.4 feet per year (between MW-1 and MW-2) for the July 2018 sampling event.

3 Sampling Procedures

3.1 Groundwater Sampling Procedures

Groundwater samples were collected by Pace Analytical Services, LLC. (Pace) of Huntersville, North Carolina (NC Certification #37706) between July 16 and 19, 2018. Purging was conducted until a minimum of three well volumes of water were removed and the field parameters had stabilized in accordance with the targets specified below. If field parameters stabilized prior to purging three well volumes, or the well was going dry, groundwater samples were collected prior to purging three well volumes. Field measurements were obtained using a calibrated water quality meter.

- 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)

Field data sheets are provided in **Appendix A**.

The water level meter and 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. Purge water was discharged to the ground surface adjacent to each well.

Samples were shipped under Chain of Custody (COC) procedures to Pace for analysis. Sample handling and custody were performed according to the EPA Guidance for Field Samplers.

3.2 Surface Water Sampling Procedures

Surface water flow conditions were evaluated in streams located on- and off-site for sample collection during the current sampling event. Based on this evaluation, surface water samples were collected from two locations outside of the structural fill boundary to evaluate potential groundwater to surface water interaction and potential off-site impacts. Surface water sample SW-1 was collected approximately 3,000 feet south of the structural fill boundary along an unnamed tributary of Gulf Creek. Surface water sample SW-2 was collected approximately 3,100 feet west of the structural fill boundary along Shaddox Creek. Prior to sample collection, field parameters (including temperature, conductivity, pH, ORP, and DO) were measured with a water quality meter and recorded on field data sheets (**Appendix A**). Approximate surface water sampling locations are shown on **Figure 5**.

3.3 Leachate Sampling Procedures

One leachate sample was collected from on-site storage holding tanks. This leachate sample is used to evaluate potential on-site leachate impacts. The approximate leachate sampling location is shown on **Figure 6**.

4 Water Quality

In accordance with the permit, Charah is required to monitor groundwater and surface water quality at designated locations to detect if a release has occurred during operation of the structural fill. Per the Water Quality Monitoring Plan (Buxton, 2015a), Charah collects groundwater samples from nine monitoring wells (MW-1 through MW-8 and BG-1) and two surface water locations. Groundwater samples are analyzed for constituents listed in NCDEQ Solid Waste Appendix I and II, 40 CFR 257 Appendix III, and 40 CFR 257 Appendix IV. If sampling results indicate impacts to groundwater or surface water, Charah must notify NCDEQ within 14 days. If no impacts are observed, Charah must submit a report of the sampling results to NCDEQ with 120 days of the sampling event. This 2018 Second Semi-Annual Sampling Report constitutes submittal of the results within the 120 day period.

4.1 Background Site Conditions

Two groundwater sampling events were conducted prior to CCP placement (August and October 2015) at the site. The background sampling events consisted of sample collection and analysis from each of the nine monitoring wells (MW-1 through MW-8 and BG-1) and two surface water sample locations (SW-1 and SW-2).

During these initial background monitoring events, chloride, pH, TDS, and vanadium were detected at concentrations that exceeded their North Carolina 2L Groundwater Protection Standards (2L Standard) or Interim Maximum Allowable Concentration (IMAC) in groundwater samples collected from background monitoring well BG-1. Antimony, barium, chloride, chromium, cobalt, pH, TDS, and vanadium were detected at concentrations that exceeded their respective 2L Standards or IMACs in other monitoring wells prior to ash placement. Additional target analytes were detected in the samples from well BG-1 and other wells; however, these concentrations did not exceed applicable standards.

Copper and cobalt concentrations that exceeded their respective NC Surface Water & Wetland Standards (2B Standards) were reported in surface water samples collected during the initial background monitoring events, prior to CCP placement. Additionally, all EPA Appendix III constituents were detected in the surface water samples collected prior to CCP material placement, but at concentrations below their respective 2B Standards (if applicable).

During the first monitoring event, bromodichloromethane and dibromochloromethane were detected at concentrations above their respective 2L Standards in groundwater samples collected from MW-2, MW-3, and MW-7. VOCs, including trihalomethanes, are not present naturally at the site. These detections are attributed to the use of municipal water during previous well development activities. VOCs were not detected above laboratory method detection limits (MDLs) in any subsequent (2nd through 8th) background sampling events.

A detailed discussion of background groundwater conditions can be found in the *2016 Background Sampling Report* (HDR, 2016b). Additional discussion of the statistical results can be found in **Section 4.0** of this report for a better understanding of predictive limits for the background well location BG-1 as well as interwell interactions.

4.2 Groundwater Analytical Results

Constituent concentrations that exceeded 2L Standards during the current sampling event are summarized below. The monitoring well exhibiting the highest concentration for a given constituent is provided in parentheses after the range of concentrations. Note that well MW-2 was not sampled during the current monitoring event because it was purged dry and did not recover sufficiently to facilitate sample collection. A summary of laboratory results is presented in **Table 6**.

EPA Appendix III Constituent Exceedances

- Chloride: 20,500 to 1,000,000 µg/L (MW-3)
- pH: 6.2 to 7.6 S.U. (MW-4)
- Total Dissolved Solids: 233,000 to 2,170,000 µg/L (MW-3)

EPA Appendix IV Constituent Exceedances

- Barium: 101 to 1,020 µg/L (MW-8)
- Chromium: <2.5 µg/L to 81.4 µg/L (MW-3)

EPA Appendix I Metal Exceedances

- No EPA Appendix I Metals were detected above the 2L Standards or IMACs.

EPA Appendix I VOC Exceedances

- No VOCs were detected above the laboratory MDLs.

Appendix III and Appendix IV constituents have consistently been detected above 2L Standards and IMACs in on-site monitoring wells, including background monitoring well BG-1, throughout each sampling event. Exceedances were detected prior to the placement of CCP and have generally remained consistent throughout the monitoring period. Concentration versus time plots generated for three constituents (chloride, barium, and TDS) with the most frequent detections and/or exceedances of regulatory criteria in groundwater samples collected during the detection monitoring period (October 2015 to July 2018) are included in **Appendix B**. In general, constituent concentrations varied through the first four to five sampling events (October 2015 through April 2016) before stabilizing for the remainder of the monitoring period. This early variation in concentrations is typical as the sand pack in a new well “settles in” and may also more strongly reflect seasonal variation since the wells were sampled monthly to maintain compliance. Once the sampling schedule was revised to a semi-annual basis, constituent concentrations gained consistency and continue as such through the most recent sampling event.

During the current event, barium, chromium, chloride, pH, and TDS were detected at concentrations above their respective 2L Standards. The presence of naturally occurring metals above the 2L Standard is common in North Carolina due to various geologic conditions. The presence of naturally occurring metals (i.e., weathering of crystalline parent material) was discussed in more detail in the *Initial Background Groundwater & Surface Water Monitoring Event* (Buxton, 2015c). The laboratory report for the current sampling event is provided in **Appendix C** and electronic data deliverables (EDDs) in **Appendix D**.

Table 5: Analyte Detections and Exceedances - July 2018

		Monitoring Well Samples										QA/QC Samples			Surface Water Samples			Leachate
Analyte	**CAS Number**	BG-1	MW-1	MW-2*	MW-3	MW-4	MW-5	MW-6	MW-7R	MW-8	***2L Standard or IMAC***	Equip. Blank	Amb. Blank	Duplicate (MW-6)	SW-1	SW-2*	***2B Standard***	Leachate-1
Antimony (µg/l)	7440-36-0	ND	ND	NT	ND	ND	ND	ND	ND	ND	*1*	ND	ND	ND	ND	NT	*5.6*	ND
Arsenic (µg/l)	7440-38-2	ND	ND	NT	ND	ND	ND	ND	ND	ND	*10*	ND	ND	ND	**19.7**	NT	*10*	18.8
Barium (µg/l)	7440-39-3	335	155	NT	510	306	101	104	193	**1020**	*700*	ND	ND	99.6	979	NT	*1,000*	85.6
Beryllium (µg/l)	7440-41-7	ND	ND	NT	ND	ND	ND	ND	ND	ND	*4*	ND	ND	ND	4.6	NT	*6.5*	ND
Boron (µg/l)	7440-42-8	ND	ND	NT	ND	ND	12.2	ND	16.8	10.6	*700*	ND	ND	13.2	25.6	NT	*NS*	2770
Cadmium (µg/l)	7440-43-9	ND	ND	NT	ND	ND	ND	ND	ND	ND	*2*	ND	ND	ND	ND	NT	*2*	ND
Calcium (µg/l)	7440-70-2	28900	131000	NT	147000	65700	10100	31600	74000	98100	*NS*	ND	ND	32000	10100	NT	*NS*	268000
Chloride (µg/l)	16887-00-6	**251000**	**531000**	NT	**1000000**	**518000**	20500	231000	**284000**	**355000**	*250,000*	ND	1400	224000	12400	NT	*250,000*	17600
Chromium (µg/l)	7440-47-3	ND	6.8	NT	**81.4**	ND	5.1	ND	**33.7**	**16.6**	*10*	ND	ND	ND	29.3	NT	*50*	ND
Cobalt (µg/l)	7440-48-4	ND	ND	NT	ND	**5.7**	ND	ND	ND	ND	*1*	ND	ND	ND	**13.4**	NT	*3*	5.1
Copper (µg/l)	7440-50-8	ND	ND	NT	ND	ND	ND	ND	ND	ND	*1,000*	ND	56.9	ND	**28.9**	NT	*7*	ND
Fluoride (µg/l)	16984-48-8	140	120	NT	570	300	470	420	130	ND	*2,000*	ND	ND	380	300	NT	*1,800*	180
Lead (µg/l)	7439-92-1	ND	ND	NT	ND	ND	ND	ND	ND	ND	*15*	ND	ND	ND	**72.4**	NT	*25*	ND
Lithium (µg/l)	7439-93-2	22.3	31.4	NT	36.7	26.7	8.9	40	17.8	23.5	*NS*	ND	ND	78.5	22.8	NT	*NS*	40.3
Mercury (µg/l)	7439-97-6	ND	ND	NT	ND	ND	ND	ND	ND	ND	*1*	ND	ND	ND	ND	NT	*0.012*	ND
Molybdenum (µg/l)	7439-98-7	ND	ND	NT	7.8	ND	ND	ND	ND	ND	*NS*	ND	ND	ND	ND	NT	*160*	251
Nickel (µg/l)	7440-02-0	ND	5.6	NT	49.4	ND	ND	ND	17.4	10.8	*100*	ND	ND	ND	15.8	NT	*88*	14.7
pH* (standard units)	pH	6.6	6.6	NT	7.1	**6.2**	7.0	6.6	7.6	7.0	*6.5-8.5*	NT	NT	NT	7.5	NT	*6.0-9.0*	7.4
Selenium (µg/l)	7782-49-2	ND	ND	NT	ND	ND	ND	ND	ND	ND	*20*	ND	ND	ND	ND	NT	*5*	ND
Sulfate (µg/l)	14808-79-8	18100	6700	NT	88100	10700	4100	69700	20000	6700	*250,000*	ND	ND	53400	4700	NT	*250,000*	525000
TDS (µg/l)	TDS	**652000**	**1250000**	NT	**2170000**	**1260000**	233000	**708000**	**828000**	**856000**	*500,000*	ND	ND	690000	**2200000**	NT	*500,000*	1420000
Thallium (µg/l)	7440-28-0	ND	ND	NT	ND	ND	ND	ND	ND	ND	*0.28*	ND	ND	ND	ND	NT	*0.24*	0.66
Radium 226 (pCi/l)	13982-63-3	0.177	-0.187	NT	1.09	0.459	0.0642	0.382	0.0741	1.06	*NS*	0.614	0.211	0.206	3.12	NT	*NS*	0.585
Radium 228 (pCi/l)	15262-20-1	0.282	0.3	NT	1.7	0.109	0.137	1.02	-0.454	0.568	*NS*	0.85	1.33	0.281	1.43	NT	*NS*	0.26
Silver (µg/l)	7440-22-4	ND	ND	NT	ND	ND	ND	ND	ND	ND	*20*	ND	ND	ND	ND	NT	*0.06*	ND
Vanadium (µg/l)	7440-62-2	ND	ND	NT	ND	ND	ND	ND	ND	ND	*0.3*	ND	ND	ND	122	NT	*NS*	6.1
Zinc (µg/l)	7440-66-6	ND	ND	NT	ND	ND	ND	ND	ND	ND	*1,000*	ND	ND	ND	**119**	NT	*50*	14.1
EPA APPENDIX I VOCs																		
Acetone (µg/l)	67-64-1	ND	ND	NT	ND	ND	ND	ND	ND	ND	*6,000*	ND	ND	ND	ND	NT	*2,000*	ND
Bromodichloromethane (µg/l)	75-27-4	ND	ND	NT	ND	ND	ND	ND	ND	ND	*0.6*	ND	ND	ND	ND	NT	*NS*	ND
Bromoform (µg/l)	75-25-2	ND	ND	NT	ND	ND	ND	ND	ND	ND	*4*	ND	ND	ND	ND	NT	*4.3*	ND
Chloroform (µg/l)	67-66-3	ND	ND	NT	ND	ND	ND	ND	ND	ND	*70*	ND	ND	ND	ND	NT	*5.6*	ND
Dibromochloromethane (µg/l)	124-48-1	ND	ND	NT	ND	ND	ND	ND	ND	ND	*0.4*	ND	ND	ND	ND	NT	*NS*	ND
Carbon Disulfide (µg/l)	75-15-0	ND	ND	NT	ND	ND	ND	ND	ND	ND	*700*	ND	ND	ND	ND	NT	*NS*	ND
Dibromomethane (µg/l)	74-95-3	ND	ND	NT	ND	ND	ND	ND	ND	ND	*70*	ND	ND	ND	ND	NT	*47*	ND
1,4-Dichlorobenzene (µg/l)	106-46-7	ND	ND	NT	ND	ND	ND	ND	ND	ND	*6*	ND	ND	ND	ND	NT	*63*	ND

Notes:
1. Groundwater, surface water, and leachate samples collected from July 16-19, 2018 and analyzed by Pace Analytical Services, LLC.
2. ND = below detection limits; NE = not established; NS = no standard; NT = not tested; VOCs = volatile organic compounds.
3. 2L Standards = Groundwater Standards established under T15A NCAC 02L .0202 (April 1, 2013); IMACs = Interim Maximum Allowable Concentration established under T15A NCAC 02L .0202 (April 6, 2018).
4. 2B Standard = 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.
5. **Bold** and shade denotes above established 2L Standard/IMAC or 2B Standard; µg/l = micrograms per liter; pCi/l - picocuries per liter.
6. pH results represent field measurements recorded by Pace at the time of sampling.
7. MW-7 was replaced by MW-7R by SAEDACCO on April 19, 2017; MW-2 and SW-2 were not sampled because they were dry.

This page intentionally left blank.

4.3 Surface Water Analytical Results

Surface water samples were compared to the North Carolina Surface Water and Wetland Standards established under T15A NCAC 02B (2B Standards) or the EPA National Criteria Standard (utilized by the North Carolina Division of Water Quality as default standards for parameters not listed in 15A NCAC 02B). Exceedances of regulatory criteria for the sample collected from location SW-1 are summarized below. Note that surface water sample location SW-2 was not sampled during the current monitoring event because it was dry. A summary of laboratory results is presented in Table 6.

EPA Appendix III Constituent Exceedances

- Total Dissolved Solids: 2,200,000 µg/L

EPA Appendix IV Constituent Exceedances

- Arsenic: 19.7 µg/L
- Lead: 72.4 µg/L

EPA Appendix I Metal Exceedances

- Copper: 28.9 µg/L
- Zinc: 119 µg/L

EPA Appendix I VOC Exceedances

- No VOCs above the laboratory MDLs.

Note that standards have not been established under T15A NCAC 02B for the following constituents detected in sample SW-1 during this event: boron, calcium, cobalt, lithium, and radium 226/radium 228. Constituent exceedances of 2B Standards, while greater than reported during the January 2018 event, are generally consistent with observed concentrations reported throughout the monitoring period.

4.4 Leachate Analytical Results

One sample of leachate (LEACHATE-1) generated on-site was collected and analyzed during the current monitoring event. In general, constituent concentrations were consistent with previous leachate sample results. Leachate sampling is required by the Permit to Operate and is disposed of in compliance with the Clean Water Act at either of the aforementioned permitted disposal facilities.

5 Statistics

5.1 Methodology

Background groundwater quality was evaluated to establish statistically-derived background concentrations for the Site. Groundwater quality in downgradient wells were then compared to background concentrations to determine if a statistically significant increase (SSI) over background has occurred, as required by Section .1600 rules of the North Carolina Solid Waste Management Rules 15A NCAC 13B.

Sampling results used to establish background threshold values (BTVs) were obtained during twelve monitoring events performed between October 2015 and January 2018. Downgradient sampling results from two detection monitoring rounds in January 2018 and July 2018 were used to evaluate for SSIs. Software packages ProUCL, NCSS and SPSS were used in the production of the statistics (ProUCL is offered by the USEPA; NCSS and SPSS are licensed software packages).

Groundwater samples collected as part of the monitoring program were analyzed for EPA Appendix III and Appendix IV constituents, Appendix I Metals, and Appendix I Volatile Organic Compounds (VOCs). Only non-filtered sample results were utilized for the statistical analysis of monitored constituents.

5.1.1 Statistical Analysis

The background sample size (i.e., quantity of qualifying samples) was evaluated per constituent. Descriptive statistics were calculated for the background data set including non-detect (ND) values and excluding ND values. When NDs were included in the data set, the method detection limit (MDL) was substituted as the ND value for simple descriptive statistics. The analysis was performed with NDs removed to better understand the central tendency and range of the detected values. Note that for the trend analyses in Section 5.14 and for the establishment of statistically-derived background concentration levels in Section 5.2, imputation methods using the maximum likelihood method for NDs, regression on order statistics or Kaplan-Meier methods, where appropriate, were used.

Following the calculation of descriptive statistics the statistical analysis for the background data set was performed to evaluate for outliers, data distributions, and trends for Appendix III and IV constituents, Appendix I Metals, and Appendix I VOCs, where data quantity and quality permit. A total of thirteen monitoring events (twelve sampling rounds and one detection monitoring round) were included for the descriptive analysis of the background monitoring well results for the monitored constituents. After reviewing the results, the first monitoring round sampled in August 2015 was deemed not representative of the other monitoring events and was removed from the BTV analysis.

For downgradient monitoring results, the data analysis included the calculation of descriptive statistics for Appendix III and IV constituents, Appendix I Metals, and Appendix I VOCs (for the data sets including and excluding ND values), followed by an evaluation of outliers and trends. A total of fifteen monitoring events (the thirteen sampling rounds and the two detection monitoring rounds) were included for the descriptive analysis of the downgradient monitoring well results for the monitored constituents.

5.1.2 Outliers

Outliers are values that are not representative of the population from which they are sampled. The background and downgradient data sets were screened for outliers using the Dixon's outlier test, which is suitable for data sets containing less than 25 samples. The outlier test was conducted using a significance of one percent. For constituents that had NDs, the NDs were removed prior to testing for outliers.

A statistical outlier was identified in the background data set evaluated for one Appendix III constituent (total dissolved solids).

Statistical outliers were identified intermittently for numerous Appendix III and Appendix IV constituents and Appendix I Metals, in the data sets evaluated for downgradient monitoring wells throughout the monitoring period.

5.1.3 Data Distribution

Groundwater data was fitted to known distribution models using Goodness-of-Fit (GOF) tests incorporated into ProUCL. For data sets comprised of 50 or fewer samples, ProUCL's GOF module incorporates the Shapiro-Wilk GOF test to determine normal or lognormal distribution and Anderson-Darling to determine gamma distribution. Normal, lognormal and gamma distributions are parametric distributions. If a data set could not be fit with any of these three parametric distributions, it was considered to follow a nonparametric distribution.

Note that ProUCL does not provide GOF results for data sets with less than three detected values due to insufficient data. For purposes of estimating background concentrations, these data sets were treated under non-parametric distribution assumptions with the maximum detected value chosen to represent the background concentrations.

5.1.4 Trends

Background constituent concentrations in groundwater should demonstrate stationary conditions through time, free of trends. Constituents were analyzed for trends within the data set using a maximum likelihood estimate (MLE) regression for constituents which followed parametric distributions and Mann-Kendall tests for those that were treated under nonparametric distributional assumptions. The MLE regression can be applied to data sets that can be fitted to a specific distribution model, and that contain NDs with multiple MDLs. The Mann-Kendall test is suitable for data series with no discernable distributions and only one MDL value for NDs.

Constituents treated under nonparametric data assumptions (either tested as nonparametric or having more than 50 percent NDs) and with multiple MDLs or with less than three detected values were not assessed for trends.

The background well regression analysis showed a potential decreasing trend for one Appendix III constituent (boron).There were no increasing or decreasing trends identified for other monitoring constituents with sufficient data quantity and quality for testing with the MLE analysis or Mann-Kendall test. Although a statistical trend was identified for boron, the results can be misleading due to the short duration of the sampling program.

Trends were also evaluated for constituents in each downgradient well using the same methods as described above for the background data set. Trends were identified for select constituents at select monitoring well locations and should be monitored as additional downgradient groundwater data are collected at the site (**Section 4.2**).

5.2 Evaluation for SSIs over Background

Based on the statistical evaluations performed, BTVs were determined for the detection monitoring program at the Site for Appendix III and IV constituents and Appendix I metals. Note that UPLs were not calculated for Appendix I VOCs as all of these constituents were 100 percent non-detects. For constituents that have all ND background values, the maximum MDL is chosen to represent background and the double quantification rule (DQR) is used to evaluate whether or not there is an SSI. The BTV provided for detection monitoring constituents is the statistically-derived background concentration (i.e., upper prediction limit [UPL]), the maximum detected value or the maximum MDL depending on the level of censorship in each of the background samples.

Downgradient sampling results from the first detection monitoring round in January 2018 and the second detection monitoring round in July 2018 were used to test for SSIs. Downgradient concentrations were compared to BTVs. For constituents that have all ND background values, the DQR is applied; that is, an SSI is registered for the well-constituent pair if the downgradient concentrations exhibit detects in two consecutive sampling events.

Table 6: Summary of Evaluations for SSIs over Background for January 2018 and July 2018

	Appendix III Constituents						
	Boron	**Calcium**	**Chloride**	**Fluoride**	**pH (Field)**	**Sulfate**	**TDS**
Unit	ug/L	ug/L	mg/L	mg/L	S.U.	mg/L	mg/L
BTV (UPL)	**14.1**	**37,173**	**322**	**0.155**	**6.01 - 7.11***	**21.9**	**2,630**
Well	*First Detection Monitoring Round Results*						
MW-1	6.20	**146,000**	**547**	0.120	6.70	6.60	1,020
MW-2	**40.7**	**182,000**	**1,180**	**0.280**	**7.60**	**73.3**	2,300
MW-3	**16.6**	**169,000**	**987**	**0.460**	**7.50**	**102**	1,060
MW-4	*1.50*	**66,700**	**492**	**0.320**	6.50	12.3	1,210
MW-5	11.2	15,100	19.7	**0.680**	**7.20**	5.30	246
MW-6	6.80	34,100	240	**0.520**	7.00	**126**	790
MW-7R	13.8	**89,700**	279	0.120	**7.70**	**22.6**	855
MW-8	10.1	**100,000**	**390**	*0.0500*	**7.20**	8.00	1,020
Well	*Second Detection Monitoring Round Results*						
MW-1	*2.90*	**131,000**	**531**	0.120	6.60	6.70	1,250
MW-2	--	--	--	--	--	--	--
MW-3	*2.90*	**147,000**	**1,000**	**0.570**	7.10	**88.1**	2,170
MW-4	*2.90*	**65,700**	**518**	**0.300**	6.20	10.7	1,260
MW-5	12.2	10,100	20.5	**0.470**	7.00	4.10	233
MW-6	*2.90*	31,600	231	**0.420**	6.60	**69.7**	708
MW-7R	**16.8**	**74,000**	284	0.130	**7.60**	20.0	828
MW-8	10.6	**98,100**	**355**	*0.0500*	7.00	6.70	856

	Appendix IV Constituents								
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Fluoride**	**Lead**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L
BTV (UPL)	***3.90***	***5.00***	**434**	***0.500***	***0.500***	***2.50***	***2.50***	**0.155**	***2.50***
Well	*First Detection Monitoring Round Results*								
MW-1	*3.90*	*5.00*	175	*0.500*	*0.500*	18.4	*2.50*	0.120	*2.50*
MW-2	6.90	*5.00*	314	*0.500*	*0.500*	56.8	*2.50*	**0.280**	*2.50*
MW-3	5.80	*5.00*	**570**	*0.500*	*0.500*	5.30	*2.50*	**0.460**	*2.50*
MW-4	*3.90*	*5.00*	300	*0.500*	*0.500*	5.70	*2.50*	**0.320**	*2.50*
MW-5	*3.90*	*5.00*	123	*0.500*	*0.500*	15.3	*2.50*	**0.680**	*2.50*
MW-6	*3.90*	*5.00*	106	*0.500*	*0.500*	*2.50*	*2.50*	**0.520**	*2.50*
MW-7R	*3.90*	*5.00*	251	*0.500*	*0.500*	33.0	*2.50*	0.120	*2.50*
MW-8	*3.90*	*5.00*	**1,210**	*0.500*	*0.500*	25.3	*2.50*	*0.0500*	*2.50*
Well	*Second Detection Monitoring Round Results*								
MW-1	*3.90*	*5.00*	155	*0.500*	*0.500*	**6.80**	*2.50*	0.120	*2.50*
MW-2	--	--	--	--	--	--	--	--	--
MW-3	*3.90*	*5.00*	**510**	*0.500*	*0.500*	**81.4**	*2.50*	**0.570**	*2.50*

Appendix IV Constituents									
	Antimony	**Arsenic**	**Barium**	**Beryllium**	**Cadmium**	**Chromium**	**Cobalt**	**Fluoride**	**Lead**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L
BTV (UPL)	***3.90***	***5.00***	**434**	***0.500***	***0.500***	***2.50***	***2.50***	**0.155**	***2.50***
MW-4	*3.90*	*5.00*	306	*0.500*	*0.500*	*2.50*	5.70	**0.300**	*2.50*
MW-5	*3.90*	*5.00*	101	*0.500*	*0.500*	**5.10**	*2.50*	**0.470**	*2.50*
MW-6	*3.90*	*5.00*	104	*0.500*	*0.500*	*2.50*	*2.50*	**0.420**	*2.50*
MW-7R	*3.90*	*5.00*	193	*0.500*	*0.500*	**33.7**	*2.50*	0.130	*2.50*
MW-8	*3.90*	*5.00*	**1,020**	*0.500*	*0.500*	**16.6**	*2.50*	*0.0500*	*2.50*

Appendix IV Constituents (con't)								
	Lithium	**Mercury**	**Moly-bdenum**	**Radium-226**	**Radium-228**	**Selenium**	**Thallium**	**Total Radium**
Unit	ug/L	ug/L	ug/L	pCi/L	pCi/L	ug/L	ug/L	pCi/L
BTV (UPL)	**38.6**	***0.100***	**6.80**	**1.12**	**2.90**	***5.00***	**13.7**	**2.94**
Well	*First Detection Monitoring Round Results*							
MW-1	33.3	*0.100*	*2.50*	0.225	0.537	*5.00*	*0.0300*	0.762
MW-2	**96.6**	*0.100*	**7.10**	0.648	0.716	*5.00*	*0.0300*	1.36
MW-3	**90.2**	*0.100*	**6.90**	**1.21**	1.08	*5.00*	*0.0300*	2.29
MW-4	28.6	*0.100*	*2.50*	0.00	0.710	*5.00*	*0.0300*	0.710
MW-5	7.10	*0.100*	*2.50*	0.153	-0.0690	*5.00*	*0.0300*	0.153
MW-6	**53.7**	0.320	*2.50*	0.0517	1.07	*5.00*	*0.0300*	1.12
MW-7R	24.7	*0.100*	*2.50*	0.0579	0.393	*5.00*	*0.0300*	0.451
MW-8	25.3	0.370	*2.50*	0.298	0.427	*5.00*	*0.0300*	0.725
Well	*Second Detection Monitoring Round Results*							
MW-1	31.4	*0.100*	*2.50*	-0.187	0.300	*5.00*	*0.0300*	0.300
MW-2	--	--	--	--	--	--	--	--
MW-3	36.7	*0.100*	**7.80**	1.09	1.70	*5.00*	*0.0300*	2.79
MW-4	26.7	*0.100*	*2.50*	0.459	0.109	*5.00*	*0.0300*	0.568
MW-5	8.90	*0.100*	*2.50*	0.0642	0.137	*5.00*	*0.0300*	0.201
MW-6	**40.0**	*0.100*	*2.50*	0.382	1.02	*5.00*	*0.0300*	1.40
MW-7R	17.8	*0.100*	*2.50*	0.0741	-0.454	*5.00*	*0.0300*	0.0741
MW-8	23.5	*0.100*	*2.50*	1.06	0.568	*5.00*	*0.0300*	1.63

Appendix I Metals					
	Copper	**Nickel**	**Silver**	**Vanadium**	**Zinc**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	***2.50***	***2.50***	***2.50***	**5.50**	**10.0**
Well	*First Detection Monitoring Round Results*				
MW-1	*2.50*	13.3	*2.50*	*2.50*	**16.1**
MW-2	6.60	33.8	*2.50*	*2.50*	*5.00*
MW-3	5.60	*2.50*	*2.50*	*2.50*	*5.00*

Appendix I Metals					
	Copper	**Nickel**	**Silver**	**Vanadium**	**Zinc**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	***2.50***	***2.50***	***2.50***	**5.50**	**10.0**
MW-4	*2.50*	6.90	*2.50*	*2.50*	*5.00*
MW-5	6.90	9.00	*2.50*	*2.50*	*5.00*
MW-6	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-7R	7.10	18.0	*2.50*	*2.50*	*5.00*
MW-8	10.2	13.8	*2.50*	*2.50*	*5.00*
Well	*Second Detection Monitoring Round Results*				
MW-1	*2.50*	**5.60**	*2.50*	*2.50*	*5.00*
MW-2	--	--	--	--	--
MW-3	*2.50*	49.4	*2.50*	*2.50*	*5.00*
MW-4	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-5	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-6	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-7R	*2.50*	**17.4**	*2.50*	*2.50*	*5.00*
MW-8	*2.50*	**10.8**	*2.50*	*2.50*	*5.00*

Appendix I VOCs								
	1,4-Dichloro-benzene	**Acetone**	**Bromo-dichloro-methane**	**Bromo-form**	**Carbon disulfide**	**Chloroform**	**Dibro-mochloro-methane**	**Dibromo-methane**
Unit	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**	**ug/L**
BTV (UPL)	***0.330***	***10.0***	***0.180***	***0.260***	***1.20***	***0.140***	***0.210***	***0.210***
Well	*First Detection Monitoring Round Results*							
MW-1	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-2	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-3	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-4	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-5	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-6	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-7R	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-8	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
Well	*Second Detection Monitoring Round Results*							
MW-1	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-2	--	--	--	--	--	--	--	--
MW-3	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-4	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-5	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-6	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-7R	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-8	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*

Notes:
1. Well was not sampled as it was dry.
2. *Italic* concentration indicates a non-detect value. For background, constituent had all non-detects with the maximum method detection limit chosen as the BTV. The DQR is recommended for statistical evaluation.
3. Underlined concentration indicates a detect value in the first DM round result for constituents with 100% background non-detects.
4. **Bold and underlined** concentration indicates an SSI over background.

5.3 Statistical Summary

Note that the BTVs were calculated using well BG-1 as the background monitoring well. However, nine monitoring wells (MW-1 through MW-8 and BG-1) were installed and sampled twice (August and October 2015) prior to ash placement, thus representing pre-ash conditions at the site. When results of the January 2018 sampling event are compared to the pre-ash sampling results from those nine wells, current groundwater constituent concentrations are generally similar to concentrations reported prior to ash placement. Additional details regarding statistical methodology and results is provided in **Appendix E**.

6 Conclusions

The 2018 Second Semi-Annual Detection Monitoring event was conducted at the Brickhaven No. 2 Mine Tract "A" Structural Fill site from July 16-19, 2018. A summary of the findings from the 2018 Second Semi-Annual Detection monitoring event is provided below**.**

6.1 Groundwater

- Concentrations above 2L Standards or IMACs were detected in wells MW-1, MW-3, MW-4, MW-6, MW-7R, MW-8 and the background monitoring well BG-1. Well MW-2 was purged dry and could not be sampled.
- Exceedances of EPA Appendix III constituents (chloride and TDS) were reported in each monitoring well, with the exception of MW-5 (neither exceeded) and MW-6 (TDS exceedance only). Additionally, pH was measured in the field out of range of the 2L Standard range in well MW-4.
- Exceedances of EPA Appendix IV constituents, barium (MW-8) and chromium (MW-3, MW-7R, and MW-8), were reported in samples collected during the current sampling event.
- No exceedances were reported for EPA Appendix I Metals and VOCs during the current sampling event.
- Although detected at concentrations above the laboratory MDLs, standards have not been established by NCDEQ for calcium, lithium, molybdenum, and radium 226/radium 228.
- In general, groundwater concentrations remained consistent with previous sampling events, including those completed prior to CCP placement in the structural fill.

6.2 Surface Water

- Concentrations above 2B Standards were detected in the surface water sample SW-1. Surface water location SW-2 was dry and could not be sampled.
- An exceedance of the EPA Appendix III constituent TDS was reported in the sample collected from SW-1.
- Exceedances of EPA Appendix IV constituents, arsenic and lead, were reported in the sample collected from SW-1.
- Exceedances of EPA Appendix I metals, copper and zinc, were reported in the sample collected from SW-1.
- Although detected at concentrations above the laboratory MDLs, standards have not been established by NCDEQ for boron, calcium, cobalt, lithium, radium 226/radium 228, and vanadium.
- In general, surface water concentrations remained consistent with previous sampling events, including those completed prior to CCP placement in the structural fill.

6.3 Leachate

- Based on laboratory analysis of the Leachate-1 sample collected during this sampling event, concentrations of EPA Appendix III, Appendix IV, and Appendix I Metals

remained consistent with previous sampling events (i.e., no significant increases or decreases).

6.4 Statistical Analysis

- The analysis is based on an interwell analysis consisting of 12 monitoring events of the background well BG-1 (four more than the required eight). Additional subsequent sampling events could provide greater refinement and confidence of statistical significance.
- A statistical outlier was identified in the background data set evaluated for TDS. Intermittent Appendix III and Appendix IV constituents and Appendix I Metals, in the data sets evaluated for downgradient monitoring wells, were noted throughout the monitoring period and were determined to be outliers relative to all of the parameter values collected over the 13 monitoring events from all wells to date.
- **Table 7** depicts those parameters with statistical significance compared to background at each well location.
- Although BTVs were calculated using well BG-1 as the background monitoring well, the nine monitoring wells (MW-1 through MW-8 and BG-1) were installed and sampled twice (August and October 2015) prior to ash placement, thus representing pre-ash conditions at the site. When results of the July 2018 sampling event are compared to the pre-ash sampling results from those nine wells, current groundwater constituent concentrations are generally similar to concentrations reported prior to ash placement.

6.5 Overall Summary

Based on laboratory data from samples collected as part of this monitoring event, detections are similar to the background and pre-CCP placement concentrations and remain absent from, or orders of magnitude higher than onsite leachate samples collected; therefore, CCP material placement at the Brickhaven Site does not appear to have an impact to groundwater or surface water in the vicinity of the site.

7 Recommendations

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

- Incorporate MW-7R into statistical analysis after four sampling events.
- Continue to sample semi-annually per the approved Water Quality Sampling Plan, as well as incorporating Chatham County quarterly split sampling data, to improve the dataset for greater statistical confidence and refinement.
- Evaluate the validity of SSIs by further assessing sampling protocols/performance, spatial variability, and seasonality of constituent concentrations as additional sampling rounds are conducted.

The information above summarizes the findings from the detection monitoring event. HDR believes that the presence of SSIs is the result of limited background data collected prior to CCP placement (August and October 2015 sampling events) and is influenced by natural and seasonal variations at the site. Thus, HDR recommends that the site remain in the Detection Monitoring Program.

8 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.*

Buxton Environmental. 2015c*. Initial Background Groundwater & Surface Water Monitoring Event.* October 2015.

Buxton Environmental. 2016. *Design Hydrogeologic Report for Brickhaven No.2 Mine Tract "A" Structural Fill. Addendum 2, March 2016.*

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.*

HDR. 2016b. *Background Sampling Report. November 2016.*

HDR. 2017. *2017 Initial Semi-Annual Detection Monitoring Report. January 2017.*

HDR. 2017b. *2017 Semi-Annual Detection Monitoring Report. October 2017.*

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.*

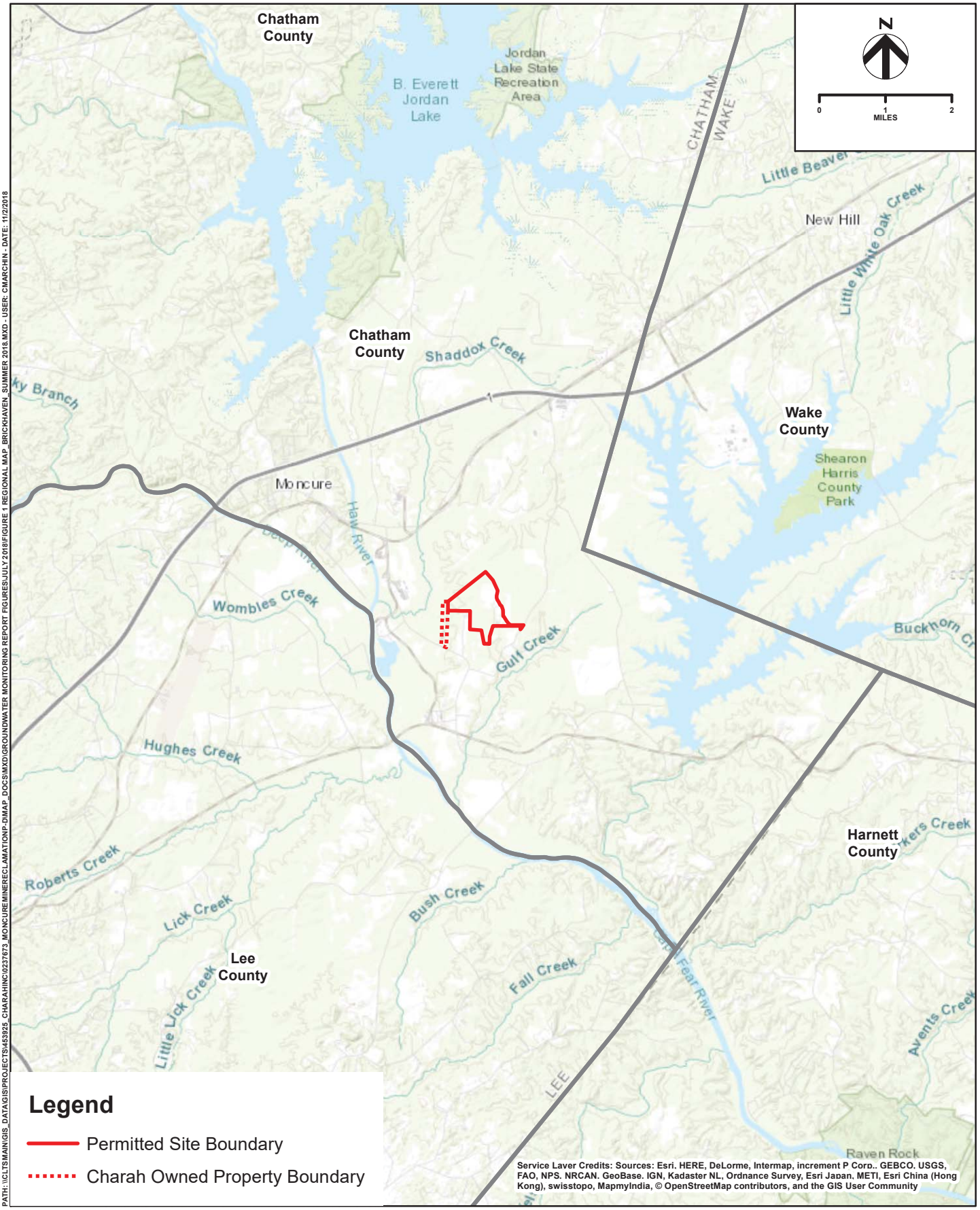
Singhal, B. B.S. and R. P. Gupta. 2010*. Applied Hydrogeology of Fractured Rocks: Springer, 2nd Edition*, 408p. (Table 8-1, p. 140)

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

Figures

Figure 1: Regional Site Location Map
Figure 2: Regional USGS Topographic Map
Figure 3: Site Layout Map with Monitoring Well Locations
Figure 4: Potentiometric Surface Map – July 2018
Figure 5: Surface Water Sample Location Map
Figure 6: Leachate Sample Collection Location

This page intentionally left blank.



PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\453925_CHARAHINC\0237873_MONCUREMINERECLAMATIONP-DMAP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\JULY 2018\FIGURE 1 REGIONAL MAP_BRICKHAVEN_SUMMER 2018.MXD - USER: CMARCHIN - DATE: 11/2/2018

REGIONAL SITE LOCATION MAP
CHARAH, INC
MONCURE, NORTH CAROLINA

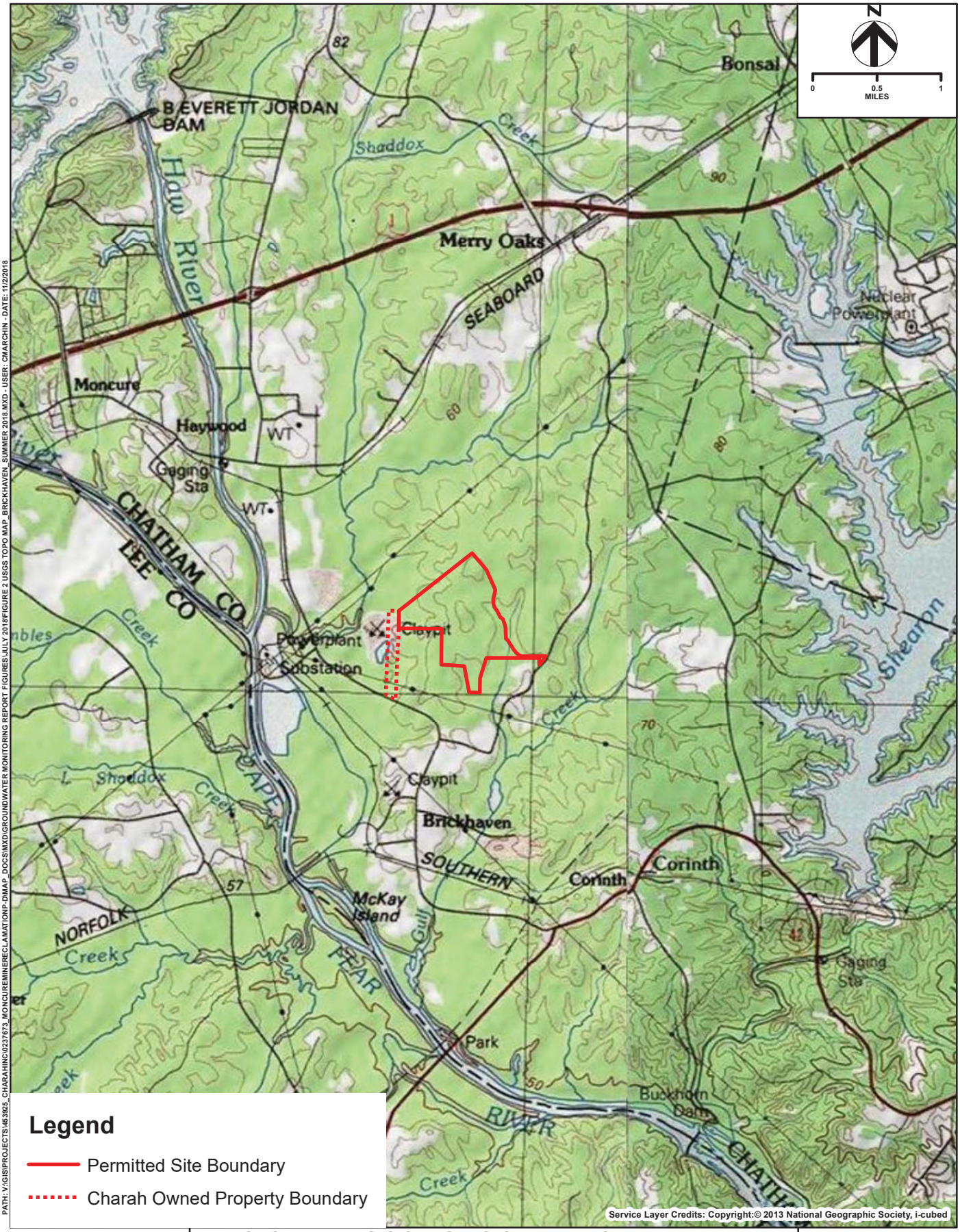
BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

OCTOBER 2018

FIGURE

1



Legend

- Permitted Site Boundary
- Charah Owned Property Boundary

PATH: V:\GIS\PROJECTS\463925_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-DM\AP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\JULY 2018\FIGURE 2 USGS TOPO MAP_BRICKHAVEN_SUMMER 2018.MXD - USER: CMARCHIN - DATE: 11/2/2018

REGIONAL USGS TOPOGRAPHIC MAP
CHARAH, INC
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE

OCTOBER 2018

FIGURE

2

PATH: V:\GIS\PROJECTS\463925_CHARAHINC\023787\3_MONCURE\MINERECLAMATION\P-DMAP_DOC\SMXD\GROUNDWATER MONITORING REPORT FIGURES\JULY 2018\FIGURE 3 SITE LAYOUT MAP_BRICKHAVEN_SUMMER 2018_CSM.MXD - USER: CMARCHIN - DATE: 11/2/2018

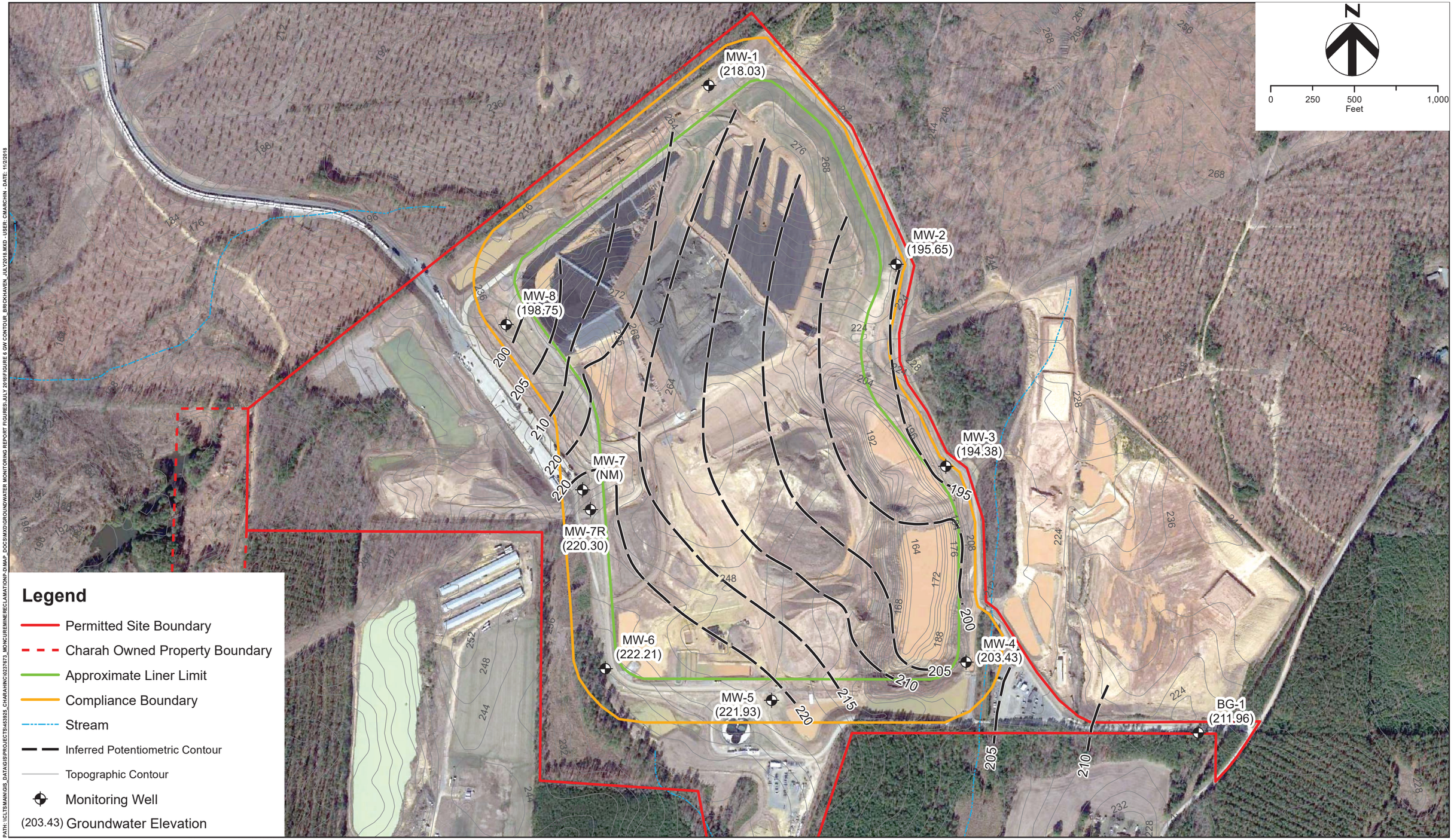


Note:
1. Topography data for the site was obtained from NCDOT Geographic Information System (GIS) website (Dated 2007).
2. Aerial photography was obtained from Google Earth dated 2018.

SITE LAYOUT MAP WITH MONITORING WELL LOCATIONS
CHARAH, INC
MONCURE, NORTH CAROLINA
BRICKHAVEN NO. 2 MINE TRACT "A"

OCTOBER 2018

FIGURE
3



PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\453925_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-D\MAP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\JULY 2018\FIGURE 6 GW CONTOUR_BRICKHAVEN_JULY2018.MXD - USER: CMARCHIN - DATE: 11/2/2018

Note:
1. Groundwater elevations dericed from depth to water measurements collected on July 16, 2018.
2. Topography data for the site was obtained from NCDOT Geographic Information System (GIS) website (Dated 2007).
3. Aerial photography was obtained from Google Earth dated 2018.
4. NM - Not Measured

HDR

WATER TABLE SURFACE MAP - JULY 2018
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
OCTOBER 2018

FIGURE
4

PATH: V:\GIS\PROJECTS\453925_CHARAHINC\023767\3_MONCURE\MINERECLAMATION\P-D\MAP_DOC\SMXD\GROUNDWATER MONITORING REPORT FIGURES\JULY 2018\FIGURE 4 SURFACE WATER SAMPLE MAP_BRICKHAVEN_SUMMER 2018_CSM.MXD - USER: CMARCHIN - DATE: 11/2/2018



Legend

- Permitted Site Boundary
- Charah Owned Property Boundary
- Compliance Boundary
- Approximate Liner Limit
- Stream
- Topographic Contour
- Surface Water Sample Location
- Monitoring Well

Note:
1. Topography data for the site was obtained from NCDOT Geographic Information System (GIS) website (Dated 2007).
2. Aerial photography was obtained from Google Earth dated 2018.

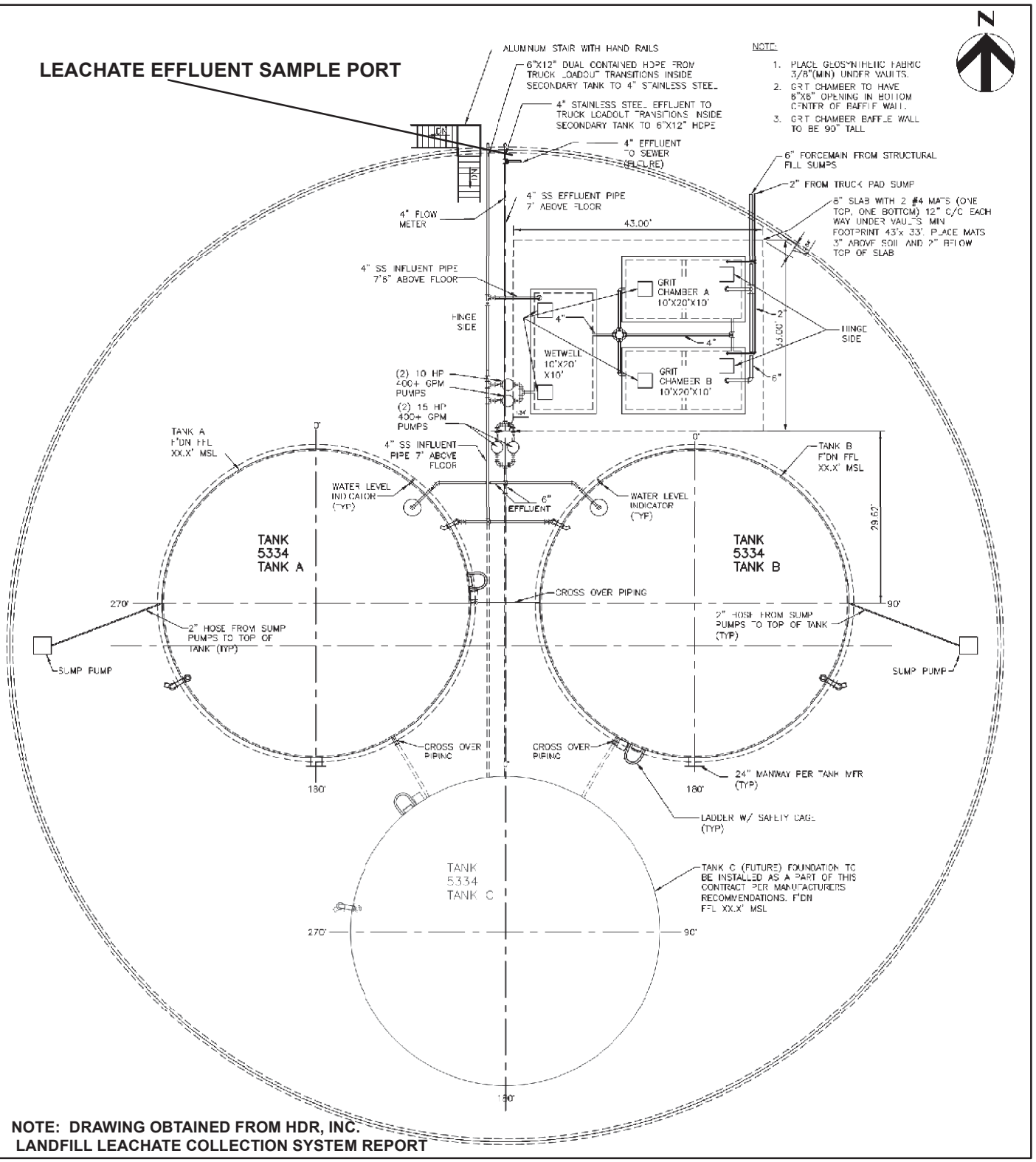
SURFACE WATER SAMPLE LOCATION MAP
CHARAH, INC.
MONCURE, NORTH CAROLINA

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
OCTOBER 2018

FIGURE
5

This page intentionally left blank.



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

PATH: \\CLTSMAIN\GIS_DATA\GIS\PROJECTS\453925_CHARAHINC\0237673_MONCUREMINERECLAMATIONP-D\MAP_DOCS\MXD\GROUNDWATER MONITORING REPORT FIGURES\JULY 2018\FIGURE 5 LEACHATE LOCATIONS_BRICKHAVEN.MXD - USER: CMARCHIN - DATE: 11/2/2018

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

BRICKHAVEN NO. 2 MINE TRACT "A"

DATE
OCTOBER 2018

FIGURE
6

This page intentionally left blank.

A

Appendix A – Field Data Sheets

This page intentionally left blank.

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of _
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR/CHARAH Location: BRICKHAVEN NC Project #: BRICKHAVEN LF 3Q

Name and Affiliation (Sampler(s)): JFA PACE ANALYTICAL

Name and Affiliation (Inspector): NA

Well Information

Well ID: LEACHATE

Well Diameter: _____

Total Well Depth: _____ ft

Static Water Level: _____ ft

Height of Water Column: _____ ft

Well Locked: (YES / NO)

Construction: (PVC/Steel/Stainless Steel)

Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: _____ gallons

Cal. 3 Volumes: _____ gallons

Pump Intake: _____ ft

Purge Information

Date Purged: ___/___/___ Start: _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ (gallons/mls)

Sampling Information

Date Collected: 7/16/18 Time Collected: 1720 (am) pm

Sampling Equipment Used: GRAB Instrument ID: YSI PROPLUS 2148

Bottle Type	Preservation	Analysis Required
		SUPPLIED IRT

Field Measurements/Observations

Sample Temp (°C): 28.8 Time: 1720 Turbidity (ntu): 6.8 Time: 1720

Diss Oxy (mg/L): 6.3 Time: _____ Fe 2+ mg/L: ND Time: _____

Specific Cond. (uS): 1694 Time: _____ Res. Cl (mg/L)/(µg/L): _____ Time: _____

Sample pH (s.u.): 7.4 Time: _____ Odor: ND Time: _____

ReDox (mV): 22.8 Time: _____ Appearance: CLEAR Time: _____

ReDox (EH value):YSI ProPlus +200mV 222.8 Other: _____ Time: _____

General/Weather Observations: _____

(sunny/cloudy/rainy) Temp 95 (°F) Wind 0-5 (mph)

Sampler Signature: [signature] Date: 7-16-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH, HOR Location: BRICKHAVEN NC Project #: BRICKHAVEN 2.F. Q3

Name and Affiliation (Sampler(s): JFA - PACE ANALYTICAL

Name and Affiliation (Inspector): AA

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

Pump Intake: ft

Purge Information

Date Purged: 7/16/18 Start: 1037 Finish: Purge Rate:

Purging Method: Total Volume Purged: (gallons/mls)

Sampling Information

Date Collected: 7/16/18 Time Collected: 1037 (am/pm)

Sampling Equipment Used: GRAB Instrument ID: YSI PROPLUS 21416

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 22.9 Time: Turbidity (ntu): 995 Time: 1037

Diss Oxy (mg/L): 5.9 Time: Fe 2+ mg/L: TOO TURBID Time:

Specific Cond. (uS): 70.7 Time: Res. Cl (mg/L)/(µg/L): Time:

Sample pH (s.u.): 7.5 Time: Odor: NO Time:

ReDox (mV): 132.0 Time: Appearance: REP Time:

ReDox (EH value):YSI ProPlus +200mV 332.0 Other: Time:

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 85 (°F) Wind 0-5 (mph)

Sampler Signature: Jesse Ahl Date: 7-16-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR CH2MHILL Location: BRUNSWICK NC Project #: BRUNSWICK LF3Q

Name and Afiliation (Sampler(s): JEA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

Well Information

Well ID: SW 2

Well Diameter: _____

Total Well Depth: _____ ft

Static Water Level: _____ ft

Height of Water Column: _____ ft

Well Locked: (YES / NO)

Construction: (PVC/Steel/Stainless Steel)

Multi Factor*: _____ [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: _____ gallons

Cal. 3 Volumes: _____ gallons

Pump Intake: _____ ft

Purge Information

Date Purged: ___/___/___ Start : _____ Finish: _____ Purge Rate: _____

Purging Method: _____ Total Volume Purged: _____ (gallons/mls)

Sampling Information

Date Collected: ___/___/___ Time Collected: _____ (am/pm)

Sampling Equipment Used: _____ Instrument ID: _____

Bottle Type	Preservation	Analysis Required

Field Measurements/Observations

Sample Temp (°C): _____ Time: _____ Turbidity (ntu): _____ Time: _____

Diss Oxy (mg/L): _____ Time: _____ Fe 2+ mg/L: _____ Time: _____

Specific Cond. (uS): _____ Time: _____ Res. Cl (mg/L)/(µg/L): _____ Time: _____

Sample pH (s.u.): _____ Time: _____ Odor: _____ Time: _____

ReDox (mV): _____ Time: _____ Appearance: _____ Time: _____

ReDox (EH value):YSI ProPlus +200mV _____ Other: _____ Time: _____

General/Weather Observations: NO FLOW 35°35'58"N 79°02'01"W

(sunny/cloudy/rainy) Temp. 95 (°F) Wind 0-5 (mph)

Sampler Signature: Jane Ahl Date: 7-16-14

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR/CIMARRON Location: BRICKHAVEN Project #: BRICKHAVEN 2.F. Q3

Name and Afiliation (Sampler(s)): JEA - PACE ANALYTICAL

Name and Afiliation (Inspector): NA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 12.82 ft Casing Volume: 5.05 gallons

Height of Water Column: 30.96 ft Cal. 3 Volumes: 15.15 gallons

Pump Intake: 41 ft

Purge Information

Date Purged: 7-16-18 Start: 1455 Finish: 1535 Purge Rate: 100 mL/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 3500 (gallons/mls)

Sampling Information

Date Collected: 7/16/18 Time Collected: ~~1340~~ 1540 (am/pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 2148

Bottle Type	Preservation	Analysis Required
		SAMPLING KIT

Field Measurements/Observations

Sample Temp (°C): 22.9 Time: 1540 Turbidity (ntu): 0.5 Time: 1540

Diss Oxy (mg/L): 0.7 Time: Fe 2+ mg/L: ND Time:

Specific Cond. (uS): 1102 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.6 Time: Odor: ND Time:

ReDox (mV): 28.5 Time: Appearance: CLEAR Time:

ReDox (EH value): YSI ProPlus +200mV 228.5 Other: — Time: —

General/Weather Observations: 1500 - PUMP OFF - PAUSE TO MONITOR CHECK PH 7 & PH 4 - 3rd PH PRO USED CABLES - CLEAR OIL (sunny/cloudy/rainy) Temp. 95 (°F) Wind — (mph)

Sampler Signature: Jean Dal Date: 7-16-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1500	23.7	1.3	1109	2.4	265.7	5.3	500	13.45	
1520	22.8	0.8	1111	6.5	83.6	0.7	2000	13.70	
1525	24.2	0.7	1098	6.5	60.0	1.11	2500	13.73	
1530	23.8	0.6	1100	6.6	46.4	0.7	3000	13.71	
1535	23.2	0.7	1094	6.6	34.2	0.6	3500	13.73	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 2
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: CHARAH/HDR Location: BRICKHAVEN NC Project #: BRICKHAVEN LFQ3

Name and Afiliation (Sampler(s): JFA - PACE ANALYTICAL

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW 1

Well Diameter: ~~2~~ 2

Total Well Depth: 75.55 ft

Static Water Level: 62.06 ft

Height of Water Column: 13.49 ft

Well Locked: (YES / NO)

Construction: (PVC/Steel/Stainless Steel)

Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 2.20 gallons

Cal. 3 Volumes: 6.6 gallons

Pump Intake: 73.5 ft

Purge Information

Date Purged: 7/19/18 Start: 1205 Finish: 1505 Purge Rate: 150 mL/m

Purging Method: SS SUB PUMP Total Volume Purged: 27000 (gallons/mls)

Sampling Information

Date Collected: 7/19/18 Time Collected: 1510 (am/pm)

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 23.3 Time: 1510 Turbidity (ntu): 9.3 Time: 1510

Diss Oxy (mg/L): 0.8 Time: Fe 2+ mg/L: ND Time:

Specific Cond. (uS): 1988 Time: Res. Cl (mg/L)/(µg/L): — Time:

Sample pH (s.u.): 6.6 Time: Odor: ND Time:

ReDox (mV): -76.2 Time: Appearance: CLEAR Time:

ReDox (EH value): YSI ProPlus +200mV 123.8 Other: — Time:

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 88 (°F) Wind 10-15 (mph)

Sampler Signature: [signature] Date: 7-19-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1210	23.8	0.9	1517	6.8	-73.9	401.2	750	62.08	
1215	22.8	1.0	1296	6.8	-84.6	514.8	1500	62.08	
1220	23.1	1.1	1143	~~2~~ 6.9	-88.8	483.9	2250	62.09	
1225	23.5	1.1	988	6.9	-89.0	369.3	3000	62.10	
1230	23.9	1.2	947	6.9	-88.7	305.6	3750	62.09	

Client: CHARAH/TVOR

Location: BRICKHAVEN NC

Project: BRICKHAVEN LF (Q)

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1235	23.7	1.2	846	7.0	-88.1	283.6	4500	62.10	
1240	22.9	1.2	796	7.0	-89.1	206.6	5250	62.10	
1245	23.6	1.2	800	7.0	-90.0	149.6	6000	62.10	
1250	23.4	1.2	787	7.0	-90.4	158.6	6750	62.10	10 min
1300	23.6	1.2	752	7.0	-91.1	100.5	8250	62.10	RATE
1310	23.9	1.2	752	7.0	-91.8	115.0	9750	62.10	
1320	23.1	1.2	817	7.0	-91.7	69.7	11250	62.10	
1330	23.8	1.2	806	6.9	-92.3	54.6	12750	62.10	
1340	23.2	1.1	1034	6.9	-90.7	35.1	14250	62.10	
1350	23.6	1.2	1100	6.8	-90.4	29.3	15750	62.10	
1400	23.3	1.1	1234	6.8	-89.7	29.1	17250	62.60	
1410	23.8	1.0	1400	6.7	-83.1	19.0	18750	62.10	
1420	23.3	1.0	1489	6.7	-83.3	15.8	20250	62.10	
1430	23.4	1.0	1612	6.7	-81.9	10.9	21750	62.10	
1435	23.6	0.9	1622	6.7	-81.7	11.7	22500	62.10	
1440	23.7	0.9	1688	6.7	-80.8	12.3	23250	62.10	
1445	23.3	0.9	1761	6.7	-77.6	9.3	24000	62.10	
1450	23.8	0.8	1823	6.6	-79.1	9.1	24750	62.10	
1455	23.8	0.9	1897	6.7	-77.8	9.8	25500	62.10	
1500	23.2	0.9	1927	6.6	-74.9	9.8	26.250	62.10	
1505	23.1	0.8	1978	6.6	-75.3	9.2	27 000	62.10	

Field Data Sheet

Client: HDR CHARAH Location: BURKHAVEN NC Project #: BURKHAVEN GP 3 Q

Name and Affiliation (Sampler(s): JFA PACE ANALYTICAL

Name and Affiliation (Inspector): NA

Well Information

Well ID: MW2

Well Diameter: 2

Total Well Depth: 50.15 ft

Static Water Level: 36.11 ft

Height of Water Column: 14.04 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: 2.29 gallons

Cal. 3 Volumes: 6.87 gallons

Pump Intake: 49.5 ft

Purge Information

Date Purged: 7/19/18 Start: 1625 Finish: 1920 Purge Rate: 50 ml/m

Purging Method: SS SUB PUMP Total Volume Purged: 14000 (gallons/mls)

Sampling Information

Date Collected: / / Time Collected: (am/pm)

Sampling Equipment Used: Instrument ID:

Bottle Type	Preservation	Analysis Required
LOST FLOW @ 1920		

Field Measurements/Observations

Sample Temp (°C): Time: Turbidity (ntu): Time:

Diss Oxy (mg/L): Time: Fe 2+ mg/L: Time:

Specific Cond. (uS): Time: Res. Cl (mg/L)/(µg/L): Time:

Sample pH (s.u.): Time: Odor: Time:

ReDox (mV): Time: Appearance: Time:

ReDox (EH value): YSI ProPlus +200mV Other: Time:

General/Weather Observations: INSUFFICIENT VOLUME TO SAMPLE

(sunny/cloudy/rainy) Temp. 85 (°F) Wind 0-5 (mph)

Sampler Signature: Date: 7-19-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1630	25.2	3.5	4495	7.5	3.4	55.3	250	—	
1635	29.7	3.0	4476	7.5	5.6	63.4	500	36.24	10 min RPD
1640	29.7	2.6	4457	7.5	9.6	75.3	1000	—	
1655	27.2	3.0	4391	7.5	9.1	83.9	1500	37.64	
1705	27.4	3.2	4357	7.5	5.7	102.6	2000	38.30	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: HDR - CHARAH

Location: BRICKHAVEN NC

Project: BRICKHAVEN LF Q3

Well ID: MW2

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1060
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1715	27.7	3.2	4325	7.5	3.4	87.38	2500	—	FLOW
1725	25.9	3.3	4285	7.5	2.2	63.7	3000	39.35	100 mL/m
1735	26.6	3.5	4247	7.5	2.9	61.6	4000	39.98	
1745	26.6	3.7	4223	7.5	-1.1	72.8	5000	40.62	
1755	27.2	3.8	4207	7.5	-1.8	51.1	6000	41.83	
1805	27.6	4.0	4168	7.5	-2.1	43.5	7000	42.01	
1815	26.4	4.1	4162	7.5	-2.5	24.3	8000	42.73	
1825	26.8	4.0	4140	7.5	-2.8	23.6	9000	43.33	
1835	26.6	4.1	4161	7.5	-1.6	19.2	10000	44.08	
1845 ~~1840~~	25.3	3.7	4092	7.5	-3.6	20.5	11000	45.19	
1855	24.7	3.4	4072	7.5	-4.5	27.1	12000	45.92	
1905	24.4	2.5	4027	7.4	-7.7	36.4	13000	47.50	
1915	24.5	2.2	4046	7.5	-8.1	36.6	14000	48.60	
1920	LOST	FLOW							

Field Data Sheet

Client: HDR/CHARAH Location: BRICKHAVEN Project #: BRICK HAVEN 2F3Q

Name and Affiliation (Sampler(s)): JFA PACE ANALYTICAL

Name and Affiliation (Inspector): NA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 28.18 ft Casing Volume: 2.51 gallons

Height of Water Column: 15.42 ft Cal. 3 Volumes: 7.53 gallons

Pump Intake: 42.5 ft

Purge Information

Date Purged: 7/17/18 Start: 1450 Finish: 1715 Purge Rate: 80 mL/M

Purging Method: SS sub Pump Total Volume Purged: 13150 (gallons/mls)

Sampling Information

Date Collected: 7/17/18 Time Collected: 1720 (am/pm)

Sampling Equipment Used: SS sub Pump Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 30.9 Time: 1720 Turbidity (ntu): 5.3 Time: 1720

Diss Oxy (mg/L): 2.9 Time: Fe 2+ mg/L: ND Time:

Specific Cond. (uS): 3724 Time: Res. Cl (mg/L)/(µg/L): Time:

Sample pH (s.u.): 7.1 Time: Odor: NP Time:

ReDox (mV): -36.9 Time: Appearance: CLEAR Time:

ReDox (EH value):YSI ProPlus +200mV 163.1 Other: Time:

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 93 (°F) Wind 0-5 (mph)

Sampler Signature: [signature] Date: 7-17-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1455	~~30.02~~ 30.2	1.2	4005	7.2	6.5	81.0	400	28.93	
1500	30.4	1.3	3957	7.2	-3.5	144.0	800	"	
1505	30.8	1.3	38.60	7.2	-14.7	112.2	1200	30.0	
1510	29.5	1.4	3848	7.2	-23.6	97.8	1600	29.71	10 mL/M
1520	29.6	1	~~3720~~ 3726	7.2	-35.9	100.4	2400	30.0	100 mL/M

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: HDR/CHARAH

Location: BRICKHAVEN NC

Project: BRICKHAVEN LF 3Q

Well ID: MW3

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	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1530	27.8	2.2	3607	7.2	-45.5	53.2	~~2400~~ 3400	30.98	
1540	29.7	2.6	3538	7.1	-49.8	63.3	4400	31.53	
1550	29.1	2.9	3458	7.1	-51.7	35.1	5400	32.13	
1600	30.3	3.1	33.96	7.1	-55.2	42.6	6400	32.68	
1610	26.9	4.0	3378	7.1	-54.1	96.0	7400	—	
1620	29.7	3.4	33.06	7.1	-56.3	78.9	8400	33.88	
1630	29.2	3.5	3306	7.1	-50.8	39.6	9400	34.40	
1640	31.7	3.4	3302	7.1	-45.0	24.4	10400	34.83	
1650	31.0	3.3	3786	7.1	-41.3	14.6	11400	35.22	
1700	32.5	3.2	3773	7.1	-44.4	13.1	12400	35.60	50 ml/m
1705	33.4	2.9	3767	7.1	-42.2	8.2	12650	35.74	
1710	32.4	2.9	3772	7.1	-38.7	8.4	12900	35.90	
1715	30.8	2.9	3774	7.1	-37.4	5.6	13150	36.05	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR/CHARAH Location: BRICKHAVEN NC Project #: BRICKHAVEN LF 3Q

Name and Afiliation (Sampler(s): JFA - PACE

Name and Afiliation (Inspector): JFA

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*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 13.70 ft Casing Volume: 1.96 gallons

Height of Water Column: 12.04 ft Cal. 3 Volumes: 5.88 gallons

Pump Intake: 24 ft

Purge Information

Date Purged: 7/17/18 Start: 845 Finish: 930 Purge Rate: 100 ml/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 4500 (gallons/mls)

Sampling Information

Date Collected: 7/17/18 Time Collected: 935 (am/pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 23.3 Time: 935 Turbidity (ntu): 7.8 Time: 935

Diss Oxy (mg/L): 0.2 Time: Fe 2+ mg/L: 1.5 Time:

Specific Cond. (uS): 2185 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.2 Time: Odor: NONE Time:

ReDox (mV): -134.0 Time: — Appearance: CLEAR Time: —

ReDox (EH value):YSI ProPlus +200mV 66 Other: Time: —

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 88 (°F) Wind 0-5 (mph)

Sampler Signature: Date: 7-17-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
850	22.5	0.8	2100	6.2	31.7	27.8	500		
855	22.0	0.4	2100	6.2	-28	33.6	1000	14.32	
910 ~~905~~	21.4	0.3	2173	6.2	-122.7	24.3	2500	14.51	
920	22.5	0.3	2176	6.2	-129.7	8.5	3500	14.50	
925	22.8	0.2	2177	6.2	-132.5	6.8	4000	14.5	
930	23.6	0.2	21.82	6.2	-133.1	2.7	4500	14.5	

Field Data Sheet

Client: HOR, CHARAH Location: BRICK HAVEN, NC Project #: BRICKHAVEN CF Q3

Name and Afiliation (Sampler(s): JFA 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: 46.96 ft Multi Factor*: 163 [*(Radius/12)2 x 3.14 x 7.48]

Static Water Level: 22.93 ft Casing Volume: 3.92 gallons

Height of Water Column: 24.03 ft Cal. 3 Volumes: 11.76 gallons

Pump Intake: 45 ft

Purge Information

Date Purged: 7/16/18 Start: 925 Finish: 1005 Purge Rate: 70 ml/min

Purging Method: SS sub pump Total Volume Purged: 2800 (gallons/(mls))

Sampling Information

Date Collected: 7/16/18 Time Collected: 1010 (am/pm)

Sampling Equipment Used: SS sub Pump Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED ICI

Field Measurements/Observations

Sample Temp (°C): 26.4 Time: 1010 Turbidity (ntu): 9.1 Time: 1010

Diss Oxy (mg/L): 0.7 Time: Fe 2+ mg/L: NP Time:

Specific Cond. (uS): 377.6 Time: Res. Cl (mg/L)/(µg/L): — Time:

Sample pH (s.u.): 7.0 Time: Odor: ND Time:

ReDox (mV): -2.7 Time: Appearance: CLEAR Time:

ReDox (EH value):YSI ProPlus +200mV 197.3 Other: — Time:

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 85 (°F) Wind 5-10 (mph)

Sampler Signature: Jesse Alch Date: 7-18-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/(mls))	Water level (ft)	Other
930	26.1	0.5	472.9	7.2	17.1	15.9	350	24.02	
935	26.6	0.5	464.8	7.2	9.6	11.3	700	24.60	
940	26.1	0.5	451.7	7.2	4.1	11.7	1050	25.02	
945	25.8	0.5	420.3	7.1	2.3	10.5	1400	25.50	
950	26.7	0.6	404.8	7.1	1.2	12.3	1750	25.95	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: HDR, BRICKHAVEN

Location: BRICKHAVEN NC

Project: BRICKHAVEN LF Q3

Well ID: MW 5

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1060
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
955	27.1	0.6	396.2	7.0	-0.1	9.9	2100	—	
1000	27.4	0.7	385.8	7.00	-1.3	9.2	2450	26.63	
1005	26.9	0.7	379.1	7.00	-2.5	8.8	2800	26.95	

Pace Analytical	Document Name: Field data Sheet	Date Issued: July 28, 2016 Page: 1 of 1
	Document Number: F-CAR-FLD-001-rev.01	Issuing Authority: Pace Huntersville Quality Office

Field Data Sheet

Client: HDR/CHARAA Location: BRICKHAVEN NC Project #: BRICKHAVEN LF Q3

Name and Afiliation (Sampler(s): JPA PACE ANALYTICAL

Name and Afiliation (Inspector): NA

Well Information

Well ID: MW 6

Well Diameter: ~~MW 6~~ 2

Total Well Depth: 27.93 ft

Static Water Level: 8.9 ft

Height of Water Column: 19.03 ft

Well Locked: (YES/NO)

Construction: (PVC/Steel/Stainless Steel)

Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 3.1 gallons

Cal. 3 Volumes: 9.3 gallons

Pump Intake: 25 ft

Purge Information

Date Purged: 7/17/18 Start: 1140 Finish: 1200 Purge Rate: 150 mg/m

Purging Method: PERISTALTIC PUMP Total Volume Purged: 3000 (gallons/mls)

Sampling Information

Date Collected: 7/17/18 Time Collected: 1205 (am/pm)

Sampling Equipment Used: PERISTALTIC PUMP Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 30.6 Time: ~~30.6~~ 1205 Turbidity (ntu): 1.5 Time: 1205

Diss Oxy (mg/L): 0.3 Time: 0 Fe 2+ mg/L: ND Time:

Specific Cond. (uS): 1337 Time: Res. Cl (mg/L)/(µg/L): — Time: —

Sample pH (s.u.): 6.6 Time: Odor: ND Time:

ReDox (mV): -8.4 Time: Appearance: CLEAR Time:

ReDox (EH value): YSI ProPlus +200mV 191.6 Other: — Time:

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 90 (°F) Wind 0-5 (mph)

Sampler Signature: [signature] Date: 7-17-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1145	30.5	0.9	1406	6.6	22.4	4.2	750	9.25	
1150	29.4	0.4	1364	6.6	16.5	1.9	1500	—	
1155	30.5	0.3	1351	6.6	4.3	1.3	2250	9.62	
1200	30.4	0.3	1343	6.6	-2.6	1.7	3000	—	

Field Data Sheet

Client: HDR, CHARAH Location: PARKHAVEN NC. Project #: BRICKHAVEN LF 3Q
Name and Afiliation (Sampler(s)): JFA PACE ANALYTICAL
Name and Afiliation (Inspector): NA

Well Information

Well ID: MW7R
Well Diameter: 2
Total Well Depth: 39.94 ft
Static Water Level: 21.92 ft
Height of Water Column: 18.01 ft

Well Locked: (YES) NO)
Construction: (PVC/Steel/Stainless Steel)
Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]
Casing Volume: 2.93 gallons
Cal. 3 Volumes: 8.79 gallons
Pump Intake: 37 ft

Purge Information

Date Purged: 7/18/18 Start: 1245 Finish: 1455 Purge Rate: 100 mL/m
Purging Method: SS SUB PUMP Total Volume Purged: 13000 (gallons/mls)

Sampling Information

Date Collected: 7/18/18 Time Collected: 1500 (am/pm)
Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED TZT

Field Measurements/Observations

Sample Temp (°C): 30.1 Time: 1590 Turbidity (ntu): 7.4 Time: 1500
Diss Oxy (mg/L): 2.6 Time: Fe 2+ mg/L: ND Time:
Specific Cond. (uS): 1289 Time: Res. Cl (mg/L)/(µg/L): — Time:
Sample pH (s.u.): 7.6 Time: Odor: NP Time:
ReDox (mV): -64.6 Time: Appearance: CLEAR Time:
ReDox (EH value):YSI ProPlus +200mV 135.4 Other: — Time:
General/Weather Observations:

(sunny/cloudy/rainy) Temp. 90 (°F) Wind 5-10 (mph)

Sampler Signature: [signature] Date: 7-18-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
1250	29.0	2.0	1405	7.6	9.5	546	500	22.58	
1255	30.9	2.2	1391	7.7	-2.8	560	1000	23.00	10 min
1305	29.9	2.1	1329	7.7	-11.1	315.7	2000	23.53	
1315	30.1	2.2	1364	7.7	-18.2	361.8	3000	24.08	
1325	29.8	2.2	1323	7.7	-23.0	169.5	4000	24.89	

Client: CHAR, CHARAH

Location: BRICKHAVEN NC

Project: BRICKHAVEN L.F. Q3

Well ID: MW7R

Well Diameter	Multiplication Factor*
1	0.0408
1.2	0.0918
1.625	0.1060
2	0.1630
3	0.3670
4	0.6530
6	1.4680
8	2.6100

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
1335	30.6	2.2	1288	7.7	-29.6	132.6	5000	25.53	
1345	30.3	2.3	1276	7.7	-38.0	248.4	6000	—	
1355	30.9	2.3	1420	7.7	-40.6	66.7	7000	26.10	
1405	29.6	2.4	1397	7.7	-44.2	26.5	8000	27.25	
1415	29.4	2.5	1373	7.7	-50.6	18.9	9000	27.80	
1425	30.6	2.4	1344	7.6	-55.4	19.5	10000	—	
1435	29.8	2.5	1341	7.6	-56.9	12.5	11000	28.43	
1445	28.8	2.6	1328	7.6	-59.6	10.8	12000	29.19	5 min
1450	26.8	2.6	1313	7.6	-61.6	10.9	12500	29.29	
1455	28.6	2.5	1286	7.6	-65.8	7.3	13000	29.36	

Field Data Sheet

Client: ITOR CHARAH Location: BRICKYARD Project #: BRICKYARD LF 3Q

Name and Affiliation (Sampler(s)): JFA PACE ANALYTICAL

Name and Affiliation (Inspector): NA

Well Information

Well ID: MW 8

Well Diameter: 2

Total Well Depth: 49.68 ft

Static Water Level: 38.12 ft

Height of Water Column: 11.56 ft

Well Locked: (YES) NO

Construction: (PVC) Steel/Stainless Steel)

Multi Factor*: .163 [*(Radius/12)2 x 3.14 x 7.48]

Casing Volume: 1.9 gallons

Cal. 3 Volumes: 5.7 gallons

Pump Intake: 45.6 ft

Purge Information

Date Purged: 7/19/18 Start: 855 Finish: 1035 Purge Rate: 100 mL/m

Purging Method: SS SUB PUMP Total Volume Purged: 10000 (gallons/mls)

Sampling Information

Date Collected: 7/19/18 Time Collected: 1040 (am/pm)

Sampling Equipment Used: SS SUB PUMP Instrument ID: YSI PRO PLUS 0569

Bottle Type	Preservation	Analysis Required
		SUPPLIED KIT

Field Measurements/Observations

Sample Temp (°C): 28.2 Time: 1040 Turbidity (ntu): 6.1 Time: 1040

Diss Oxy (mg/L): 0.8 Time: Fe 2+ mg/L: NO Time:

Specific Cond. (uS): 1695 Time: Res. Cl (mg/L)/(µg/L): — Time:

Sample pH (s.u.): 7.0 Time: Odor: NO Time:

ReDox (mV): -21.4 Time: Appearance: CLEAR Time:

ReDox (EH value):YSI ProPlus +200mV 178.2 Other: — Time:

General/Weather Observations:

(sunny/cloudy/rainy) Temp. 83 (°F) Wind 5-10 (mph)

Sampler Signature: Date: 7-19-18

Stabilization Test

Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume removed (gallons/mls)	Water level (ft)	Other
900	21.5	2.6	2499	7.0	74.6	67.4	500	38.33	
905	21.4	2.4	2509	7.0	65.8	69.6	1000	—	
910	21.8	2.2	2518	7.0	59.8	60.8	1500	38.38	
915	22.2	2.2	2503	7.0	54.6	51.3	2000	38.43	
920	22.0	2.1	2492	7.0	61.2	38.60	2500	—	

Pace Analytical	Document Name: Field Data Sheet	Document Issued: July 28, 2016 Page 2 of 2
	Document Number: F-CAR-FLD-001.rev.01	Issueing Authority: Pace Huntersville Quality Office

Client: HDR/CHARAH

Location: BRICKHAVEN NC

Project: BRICKHAVEN LF CQ3

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

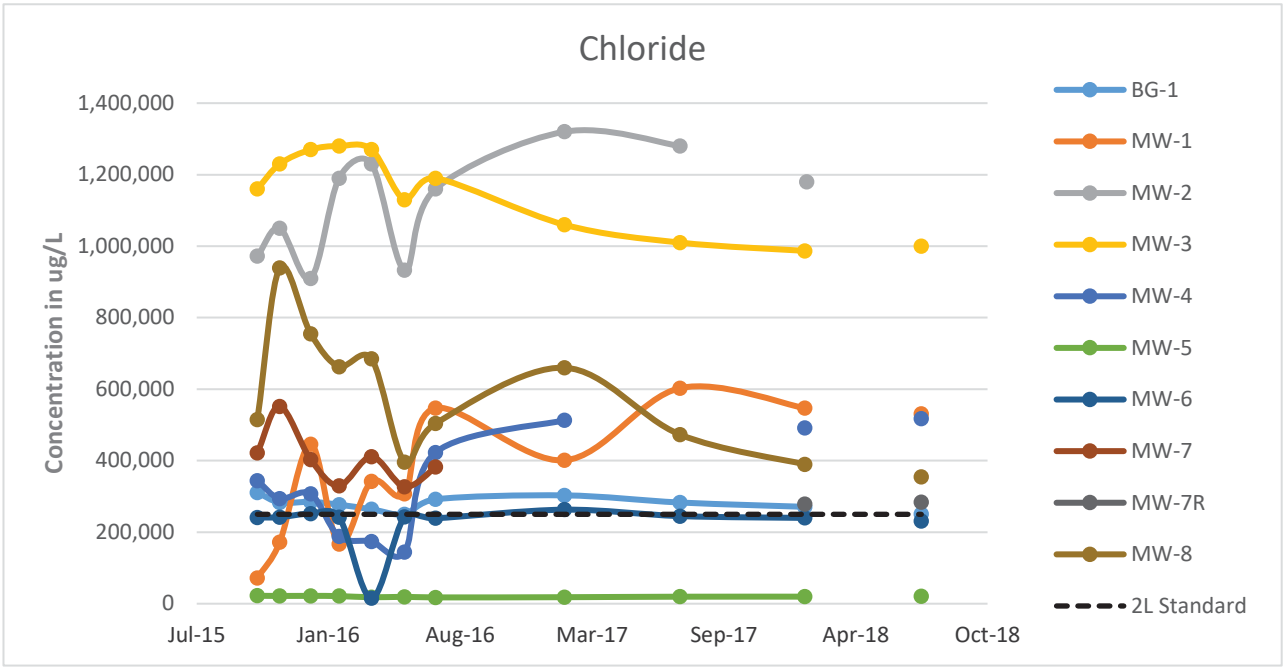
Stabilization Test

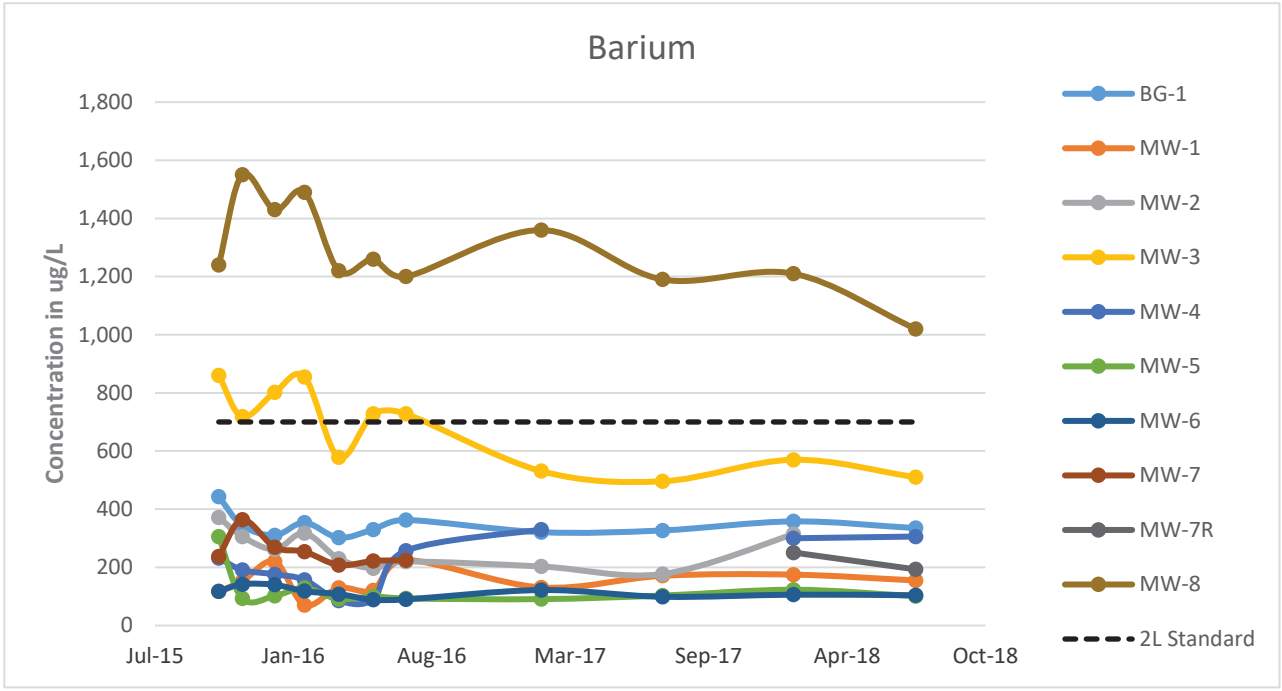
Time Purged	Temp. (°C)	Diss Oxy. (mg/L)	Spec. Cond. (uS)	pH (s.u.)	ReDox (mV)	Turbidity (ntu)	Volume Removed (gallons/mls) circle one	Water level (ft)	Other
925	22.2	2.2	2479	7.0	48.2	32.8	3000	38.43	
930	22.3	2.0	2411	7.0	45.3	27.3	3500	—	
935	24.8	1.9	2344	7.0	40.2	22.4	4000	38.48	
940	21.9	1.8	2296	7.0	35.6	39.1	4500	—	
945	21.9	1.7	2255	7.0	32.0	19.5	5000	38.54	
950	21.8	1.6	2190	7.0	28.9	14.4	5500	38.55	
955	22.1	1.5	2147	7.0	26.5	14.1	6000	—	
1000	22.3	1.4	2070	7.0	24.1	14.7	6500	38.60	
1005	22.3	1.3	1989	7.0	20.3	11.8	7000	—	
1010	22.4	1.1	1944	7.0	14.8	14.0	7500	38.63	
1015	22.5	1.0	1894	7.0	9.9	8.6	8000	38.63	
1020	22.6	1.0	1813	7.0	1.1	9.2	8500	38.63	
1025	22.9	0.9	1743	7.0	-9.6	7.9	9000	38.63	
1030	23.3	0.9	1714	7.0	-15.6	7.1	9500	—	
1035	23.1	0.9	1703	7.0	-17.9	6.2	10000	38.64	

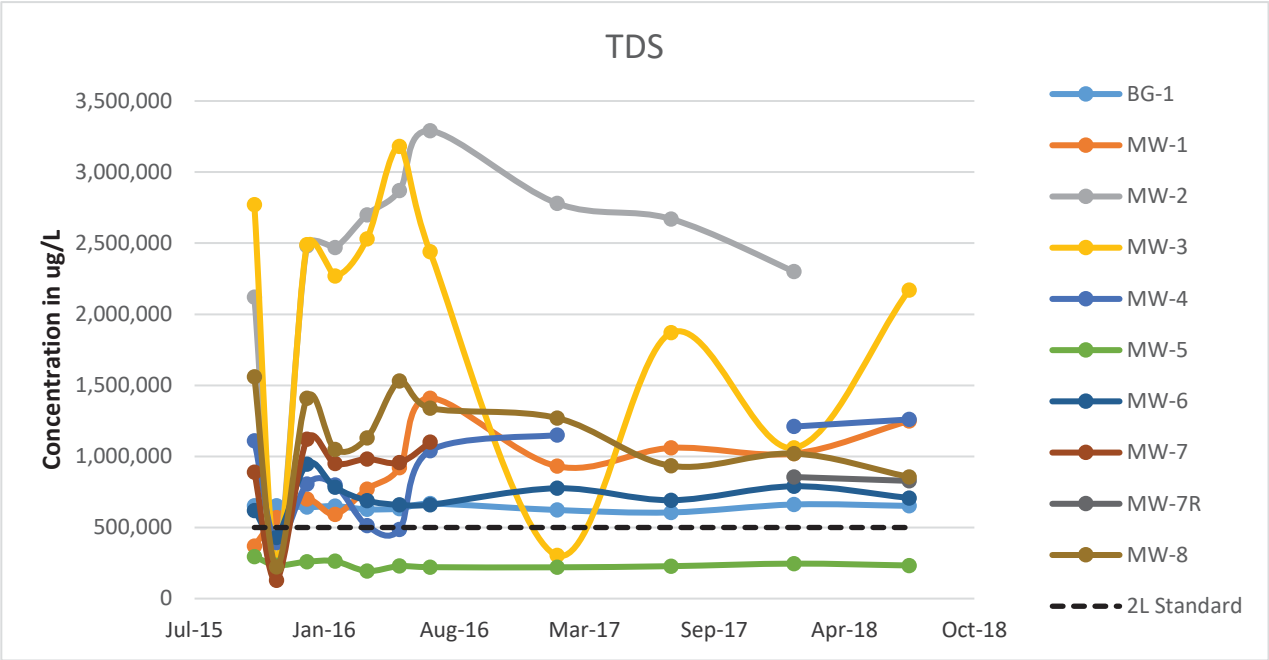
B

Appendix B – Concentration vs. Time Plots

This page intentionally left blank.


Chloride
Concentration in ug/L
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Apr-18
Oct-18
BG-1
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-7R
MW-8
2L Standard


Barium
Concentration in ug/L
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Apr-18
Oct-18
BG-1
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-7R
MW-8
2L Standard


TDS
Concentration in ug/L
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Jul-15
Jan-16
Aug-16
Mar-17
Sep-17
Apr-18
Oct-18
BG-1
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-7R
MW-8
2L Standard

C

Appendix C – Laboratory Reports, Chains of Custody, & Quality Control Data

This page intentionally left blank.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 15, 2018

Sean Quarry
HDR Engineering
440 South Church Street
Suite 1000
Charlotte, NC 28202

RE: Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Dear Sean Quarry:
Enclosed are the analytical results for sample(s) received by the laboratory between July 17, 2018 and July 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Herring
kevin.herring@pacelabs.com
1(704)875-9092
HORIZON Database Administrator

Enclosures

cc: Mike Plummer, HDR

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
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 #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Pennsylvania Certification IDs

North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92392127001	SW-1	Water	07/16/18 10:37	07/17/18 07:30
92392127002	BG-1	Water	07/16/18 15:40	07/17/18 07:30
92392127003	LEACHATE	Water	07/16/18 17:20	07/17/18 07:30
92392127004	AMB	Water	07/16/18 16:30	07/17/18 07:30
92392127005	EQ BLANK	Water	07/16/18 19:00	07/17/18 07:30
92392127006	TRIP BLANK	Water	07/16/18 00:00	07/17/18 07:30
92392127007	MW-4	Water	07/17/18 09:30	07/18/18 07:11
92392127008	MW-6	Water	07/17/18 12:05	07/18/18 07:11
92392127009	MW-3	Water	07/17/18 17:20	07/18/18 07:11
92392127010	MW-6 DUPE	Water	07/17/18 12:05	07/18/18 07:11
92392127011	AMB	Water	07/17/18 17:00	07/18/18 07:11
92392127012	EQ BLANK	Water	07/17/18 20:20	07/18/18 07:11
92392127013	TRIP BLANK	Water	07/17/18 00:00	07/18/18 07:11
92392127014	MW-5	Water	07/18/18 10:10	07/19/18 07:10
92392127015	MW-7R	Water	07/18/18 15:00	07/19/18 07:10
92392127016	AMB	Water	07/18/18 11:10	07/19/18 07:10
92392127017	EQ BLANK	Water	07/18/18 12:00	07/19/18 07:10
92392127018	TRIP BLANK	Water	07/18/18 00:00	07/19/18 07:10
92392127019	MW-8	Water	07/19/18 10:40	07/20/18 08:00
92392127020	MW-1	Water	07/19/18 15:10	07/20/18 08:00
92392127021	AMB	Water	07/19/18 13:20	07/20/18 08:00
92392127022	EQ BLANK	Water	07/19/18 18:30	07/20/18 08:00
92392127023	TRIP BLANK	Water	07/19/18 00:00	07/20/18 08:00

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92392127001	SW-1	EPA 6010D	DS	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127002	BG-1	EPA 6010D	DS	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127003	LEACHATE	EPA 6010D	DS, SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127004	AMB	EPA 6010D	DS	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127005	EQ BLANK	EPA 6010D	DS	16	PASI-A

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127006	**TRIP BLANK**	EPA 8260B	CAH	48	PASI-C
92392127007	**MW-4**	EPA 6010D	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127008	**MW-6**	EPA 6010D	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127009	**MW-3**	EPA 6010D	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127010	**MW-6 DUPE**	EPA 6010D	SH1	16	PASI-A

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127011	**AMB**	EPA 6010D	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127012	**EQ BLANK**	EPA 6010D	SH1	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127013	**TRIP BLANK**	EPA 8260B	CAH	48	PASI-C
92392127014	**MW-5**	EPA 6010D	DS	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127015	**MW-7R**	EPA 6010D	DS	16	PASI-A

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127016	**AMB**	EPA 6010D	DS	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127017	**EQ BLANK**	EPA 6010D	DS	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127018	**TRIP BLANK**	EPA 8260B	CAH	48	PASI-C
92392127019	**MW-8**	EPA 6010D	SER	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	NAL	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127020	**MW-1**	EPA 6010D	DS, SER	16	PASI-A

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	NAL	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127021	**AMB**	EPA 6010D	SER	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	NAL	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127022	**EQ BLANK**	EPA 6010D	SER	16	PASI-A
		EPA 6020B	RJS	3	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 8260B	CAH	48	PASI-C
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	NAL	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92392127023	**TRIP BLANK**	EPA 8260B	CAH	48	PASI-C

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127001	**SW-1**					
EPA 6010D	Arsenic	19.7	ug/L	10.0	07/19/18 04:55	
EPA 6010D	Barium	979	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Beryllium	4.6	ug/L	1.0	07/19/18 04:55	
EPA 6010D	Calcium	10100	ug/L	100	07/19/18 04:55	
EPA 6010D	Chromium	29.3	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Cobalt	13.4	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Copper	28.9	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Lead	72.4	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Nickel	15.8	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Vanadium	122	ug/L	5.0	07/19/18 04:55	
EPA 6010D	Zinc	119	ug/L	10.0	07/19/18 04:55	
EPA 6020B	Boron	25.6	ug/L	10.0	07/23/18 11:11	M1
EPA 6020B	Lithium	22.8	ug/L	0.50	07/23/18 11:11	
EPA 903.1	Radium-226	3.12 ± 1.45 (0.445) C:NA T:86%	pCi/L		08/01/18 11:19	
EPA 904.0	Radium-228	1.43 ± 0.823 (1.52) C:65% T:61%	pCi/L		08/02/18 11:58	
Total Radium Calculation	Total Radium	4.55 ± 2.27 (1.97)	pCi/L		08/07/18 13:44	
SM 2540C-2011	Total Dissolved Solids	2200	mg/L	25.0	07/17/18 22:45	
EPA 300.0 Rev 2.1 1993	Chloride	12.4	mg/L	1.0	07/19/18 04:41	
EPA 300.0 Rev 2.1 1993	Fluoride	0.30	mg/L	0.10	07/19/18 04:41	
EPA 300.0 Rev 2.1 1993	Sulfate	4.7	mg/L	1.0	07/19/18 04:41	
92392127002	**BG-1**					
EPA 6010D	Barium	335	ug/L	5.0	07/19/18 05:04	
EPA 6010D	Calcium	28900	ug/L	100	07/19/18 05:04	
EPA 6020B	Lithium	22.3	ug/L	0.50	07/24/18 08:35	
EPA 903.1	Radium-226	0.177 ± 0.348 (0.635) C:NA T:94%	pCi/L		08/01/18 11:19	
EPA 904.0	Radium-228	0.282 ± 0.424 (0.916) C:67% T:83%	pCi/L		08/02/18 11:58	
Total Radium Calculation	Total Radium	0.459 ± 0.772 (1.55)	pCi/L		08/07/18 13:44	
SM 2540C-2011	Total Dissolved Solids	652	mg/L	50.0	07/17/18 22:45	
EPA 300.0 Rev 2.1 1993	Chloride	251	mg/L	5.0	07/19/18 06:57	
EPA 300.0 Rev 2.1 1993	Fluoride	0.14	mg/L	0.10	07/19/18 05:49	
EPA 300.0 Rev 2.1 1993	Sulfate	18.1	mg/L	1.0	07/19/18 05:49	
92392127003	**LEACHATE**					
EPA 6010D	Arsenic	18.8	ug/L	10.0	07/19/18 05:07	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127003	**LEACHATE**					
EPA 6010D	Barium	85.6	ug/L	5.0	07/19/18 05:07	
EPA 6010D	Calcium	268000	ug/L	500	07/21/18 14:58	
EPA 6010D	Cobalt	5.1	ug/L	5.0	07/19/18 05:07	
EPA 6010D	Molybdenum	251	ug/L	5.0	07/19/18 05:07	
EPA 6010D	Nickel	14.7	ug/L	5.0	07/19/18 05:07	
EPA 6010D	Vanadium	6.1	ug/L	5.0	07/19/18 05:07	
EPA 6010D	Zinc	14.1	ug/L	10.0	07/19/18 05:07	
EPA 6020B	Boron	2770	ug/L	500	07/24/18 08:30	
EPA 6020B	Lithium	40.3	ug/L	0.50	07/23/18 11:53	
EPA 6020B	Thallium	0.66	ug/L	0.10	07/23/18 11:53	
EPA 903.1	Radium-226	0.585 ± 0.501 (0.679) C:NA T:85%	pCi/L		08/01/18 11:19	
EPA 904.0	Radium-228	0.260 ± 0.449 (0.979) C:67% T:77%	pCi/L		08/02/18 11:58	
Total Radium Calculation	Total Radium	0.845 ± 0.950 (1.66)	pCi/L		08/07/18 13:44	
SM 2540C-2011	Total Dissolved Solids	1420	mg/L	50.0	07/17/18 22:45	
EPA 300.0 Rev 2.1 1993	Chloride	17.6	mg/L	1.0	07/19/18 06:06	
EPA 300.0 Rev 2.1 1993	Fluoride	0.18	mg/L	0.10	07/19/18 06:06	
EPA 300.0 Rev 2.1 1993	Sulfate	525	mg/L	12.0	07/19/18 07:14	
92392127004	**AMB**					
EPA 8260B	Methylene Chloride	5.2	ug/L	1.0	07/21/18 23:19	
EPA 903.1	Radium-226	0.211 ± 0.365 (0.652) C:NA T:79%	pCi/L		08/01/18 11:19	
EPA 904.0	Radium-228	0.898 ± 0.577 (1.12) C:66% T:85%	pCi/L		08/02/18 11:58	
Total Radium Calculation	Total Radium	1.11 ± 0.942 (1.77)	pCi/L		08/07/18 13:44	
92392127005	**EQ BLANK**					
EPA 903.1	Radium-226	0.0604 ± 0.355 (0.725) C:NA T:92%	pCi/L		08/01/18 11:19	
EPA 904.0	Radium-228	0.123 ± 0.464 (1.05) C:65% T:77%	pCi/L		08/02/18 11:58	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127005	**EQ BLANK**					
Total Radium Calculation	Total Radium	0.183 ± 0.819 (1.78)	pCi/L		08/07/18 14:14	
92392127007	**MW-4**					
EPA 6010D	Barium	306	ug/L	5.0	07/19/18 17:14	
EPA 6010D	Calcium	65700	ug/L	100	07/19/18 17:14	
EPA 6010D	Cobalt	5.7	ug/L	5.0	07/19/18 17:14	
EPA 6020B	Lithium	26.7	ug/L	0.50	07/24/18 17:22	
EPA 903.1	Radium-226	0.459 ± 0.638 (1.08) C:NA T:88%	pCi/L		08/01/18 20:22	
EPA 904.0	Radium-228	0.109 ± 0.477 (1.08) C:73% T:89%	pCi/L		08/06/18 11:57	
Total Radium Calculation	Total Radium	0.568 ± 1.12 (2.16)	pCi/L		08/07/18 14:05	
SM 2540C-2011	Total Dissolved Solids	1260	mg/L	125	07/19/18 00:30	
EPA 300.0 Rev 2.1 1993	Chloride	518	mg/L	10.0	07/21/18 09:49	
EPA 300.0 Rev 2.1 1993	Fluoride	0.30	mg/L	0.10	07/20/18 22:25	
EPA 300.0 Rev 2.1 1993	Sulfate	10.7	mg/L	1.0	07/20/18 22:25	
92392127008	**MW-6**					
EPA 6010D	Barium	104	ug/L	5.0	07/19/18 17:17	
EPA 6010D	Calcium	31600	ug/L	100	07/19/18 17:17	
EPA 6020B	Lithium	40.0	ug/L	0.50	07/24/18 18:00	
EPA 903.1	Radium-226	0.382 ± 0.541 (0.917) C:NA T:85%	pCi/L		08/01/18 20:22	
EPA 904.0	Radium-228	1.02 ± 0.444 (0.798) C:66% T:79%	pCi/L		08/02/18 13:05	
Total Radium Calculation	Total Radium	1.40 ± 0.985 (1.72)	pCi/L		08/06/18 12:23	
SM 2540C-2011	Total Dissolved Solids	708	mg/L	50.0	07/19/18 00:31	
EPA 300.0 Rev 2.1 1993	Chloride	231	mg/L	5.0	07/21/18 10:06	
EPA 300.0 Rev 2.1 1993	Fluoride	0.42	mg/L	0.10	07/20/18 22:42	
EPA 300.0 Rev 2.1 1993	Sulfate	69.7	mg/L	1.0	07/20/18 22:42	
92392127009	**MW-3**					
EPA 6010D	Barium	510	ug/L	5.0	07/19/18 17:20	
EPA 6010D	Calcium	147000	ug/L	500	07/21/18 14:48	
EPA 6010D	Chromium	81.4	ug/L	5.0	07/19/18 17:20	
EPA 6010D	Molybdenum	7.8	ug/L	5.0	07/19/18 17:20	
EPA 6010D	Nickel	49.4	ug/L	5.0	07/19/18 17:20	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127009	**MW-3**					
EPA 6020B	Lithium	36.7	ug/L	0.50	07/24/18 18:05	
EPA 903.1	Radium-226	1.09 ± 0.766 (1.01) C:NA T:75%	pCi/L		08/01/18 20:41	
EPA 904.0	Radium-228	1.70 ± 0.460 (0.694) C:67% T:86%	pCi/L		08/02/18 13:05	
Total Radium Calculation	Total Radium	2.79 ± 1.23 (1.70)	pCi/L		08/06/18 12:23	
SM 2540C-2011	Total Dissolved Solids	2170	mg/L	250	07/19/18 00:31	
EPA 300.0 Rev 2.1 1993	Chloride	1000	mg/L	20.0	07/21/18 10:22	
EPA 300.0 Rev 2.1 1993	Fluoride	0.57	mg/L	0.10	07/20/18 22:59	
EPA 300.0 Rev 2.1 1993	Sulfate	88.1	mg/L	1.0	07/20/18 22:59	
92392127010	**MW-6 DUPE**					
EPA 6010D	Barium	99.6	ug/L	5.0	07/19/18 17:23	
EPA 6010D	Calcium	32000	ug/L	100	07/19/18 17:23	
EPA 6020B	Boron	13.2	ug/L	10.0	07/24/18 18:09	
EPA 6020B	Lithium	78.5	ug/L	0.50	07/24/18 18:09	
EPA 903.1	Radium-226	0.206 ± 0.400 (0.698) C:NA T:99%	pCi/L		08/07/18 10:20	
EPA 904.0	Radium-228	0.281 ± 0.428 (0.925) C:74% T:75%	pCi/L		08/06/18 11:57	
Total Radium Calculation	Total Radium	0.487 ± 0.828 (1.62)	pCi/L		08/07/18 14:05	
SM 2540C-2011	Total Dissolved Solids	690	mg/L	50.0	07/19/18 00:31	D6
EPA 300.0 Rev 2.1 1993	Chloride	224	mg/L	5.0	07/21/18 10:39	
EPA 300.0 Rev 2.1 1993	Fluoride	0.38	mg/L	0.10	07/20/18 23:17	
EPA 300.0 Rev 2.1 1993	Sulfate	53.4	mg/L	1.0	07/20/18 23:17	
92392127011	**AMB**					
EPA 8260B	Methylene Chloride	5.4	ug/L	1.0	07/22/18 01:13	
EPA 903.1	Radium-226	0.0282 ± 0.399 (0.814) C:NA T:89%	pCi/L		08/07/18 10:20	
EPA 904.0	Radium-228	-0.286 ± 0.385 (0.957) C:70% T:78%	pCi/L		08/06/18 11:57	
Total Radium Calculation	Total Radium	0.0282 ± 0.784 (1.77)	pCi/L		08/07/18 14:05	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127012	**EQ BLANK**					
EPA 8260B	Methylene Chloride	5.4	ug/L	1.0	07/22/18 01:29	
EPA 903.1	Radium-226	0.0692 ± 0.511 (0.976) C:NA T:89%	pCi/L		08/07/18 10:20	
EPA 904.0	Radium-228	0.850 ± 0.438 (0.766) C:72% T:84%	pCi/L		08/06/18 11:57	
Total Radium Calculation	Total Radium	0.919 ± 0.949 (1.74)	pCi/L		08/07/18 14:05	
92392127014	**MW-5**					
EPA 6010D	Barium	101	ug/L	5.0	07/21/18 18:06	
EPA 6010D	Calcium	10100	ug/L	100	07/21/18 18:06	
EPA 6010D	Chromium	5.1	ug/L	5.0	07/21/18 18:06	
EPA 6020B	Boron	12.2	ug/L	10.0	07/24/18 18:23	
EPA 6020B	Lithium	8.9	ug/L	0.50	07/24/18 18:23	
EPA 903.1	Radium-226	0.0642 ± 0.377 (0.771) C:NA T:93%	pCi/L		08/08/18 12:05	
EPA 904.0	Radium-228	0.137 ± 0.457 (1.03) C:62% T:75%	pCi/L		08/08/18 13:15	
Total Radium Calculation	Total Radium	0.201 ± 0.834 (1.80)	pCi/L		08/13/18 15:46	
SM 2540C-2011	Total Dissolved Solids	233	mg/L	25.0	07/19/18 22:18	
EPA 300.0 Rev 2.1 1993	Chloride	20.5	mg/L	1.0	07/24/18 15:47	
EPA 300.0 Rev 2.1 1993	Fluoride	0.47	mg/L	0.10	07/24/18 15:47	
EPA 300.0 Rev 2.1 1993	Sulfate	4.1	mg/L	1.0	07/24/18 15:47	
92392127015	**MW-7R**					
EPA 6010D	Barium	193	ug/L	5.0	07/21/18 18:37	
EPA 6010D	Calcium	74000	ug/L	100	07/21/18 18:37	
EPA 6010D	Chromium	33.7	ug/L	5.0	07/21/18 18:37	
EPA 6010D	Nickel	17.4	ug/L	5.0	07/21/18 18:37	
EPA 6020B	Boron	16.8	ug/L	10.0	07/24/18 18:27	
EPA 6020B	Lithium	17.8	ug/L	0.50	07/24/18 18:27	
EPA 903.1	Radium-226	0.0741 ± 0.385 (0.798) C:NA T:76%	pCi/L		08/08/18 12:05	
EPA 904.0	Radium-228	-0.454 ± 0.697 (1.65) C:59% T:77%	pCi/L		08/08/18 16:28	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127015	**MW-7R**					
Total Radium Calculation	Total Radium	0.0741 ± 1.08 (2.45)	pCi/L		08/13/18 15:46	
SM 2540C-2011	Total Dissolved Solids	828	mg/L	50.0	07/19/18 22:18	
EPA 300.0 Rev 2.1 1993	Chloride	284	mg/L	6.0	07/25/18 02:54	
EPA 300.0 Rev 2.1 1993	Fluoride	0.13	mg/L	0.10	07/24/18 16:38	
EPA 300.0 Rev 2.1 1993	Sulfate	20.0	mg/L	1.0	07/24/18 16:38	
92392127016	**AMB**					
EPA 6010D	Copper	56.9	ug/L	5.0	07/21/18 18:40	
EPA 903.1	Radium-226	-0.062 ± 0.283 (0.668) C:NA T:88%	pCi/L		08/08/18 12:35	
EPA 904.0	Radium-228	0.906 ± 0.658 (1.30) C:57% T:83%	pCi/L		08/08/18 16:28	
Total Radium Calculation	Total Radium	0.906 ± 0.941 (1.97)	pCi/L		08/13/18 15:46	
EPA 300.0 Rev 2.1 1993	Chloride	1.4	mg/L	1.0	07/24/18 16:55	
92392127017	**EQ BLANK**					
EPA 903.1	Radium-226	0.247 ± 0.297 (0.454) C:NA T:97%	pCi/L		08/08/18 12:35	
EPA 904.0	Radium-228	0.496 ± 0.578 (1.22) C:64% T:74%	pCi/L		08/08/18 16:28	
Total Radium Calculation	Total Radium	0.743 ± 0.875 (1.67)	pCi/L		08/13/18 15:46	
92392127019	**MW-8**					
EPA 6010D	Barium	1020	ug/L	5.0	07/23/18 00:54	
EPA 6010D	Calcium	98100	ug/L	100	07/23/18 00:54	M6
EPA 6010D	Chromium	16.6	ug/L	5.0	07/23/18 00:54	
EPA 6010D	Nickel	10.8	ug/L	5.0	07/23/18 00:54	
EPA 6020B	Boron	10.6	ug/L	10.0	07/24/18 17:27	
EPA 6020B	Lithium	23.5	ug/L	0.50	07/24/18 17:27	
EPA 903.1	Radium-226	1.06 ± 0.604 (0.555) C:NA T:76%	pCi/L		08/08/18 12:35	
EPA 904.0	Radium-228	0.568 ± 0.610 (1.28) C:66% T:80%	pCi/L		08/08/18 16:28	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92392127019	**MW-8**					
Total Radium Calculation	Total Radium	1.63 ± 1.21 (1.84)	pCi/L		08/13/18 15:46	
SM 2540C-2011	Total Dissolved Solids	856	mg/L	50.0	07/25/18 16:13	
EPA 300.0 Rev 2.1 1993	Chloride	355	mg/L	7.0	07/25/18 04:52	
EPA 300.0 Rev 2.1 1993	Sulfate	6.7	mg/L	1.0	07/24/18 22:20	
92392127020	**MW-1**					
EPA 6010D	Barium	155	ug/L	5.0	07/23/18 01:09	
EPA 6010D	Calcium	131000	ug/L	1000	07/23/18 19:53	
EPA 6010D	Chromium	6.8	ug/L	5.0	07/23/18 01:09	
EPA 6010D	Nickel	5.6	ug/L	5.0	07/23/18 01:09	
EPA 6020B	Lithium	31.4	ug/L	0.50	07/24/18 17:09	
EPA 903.1	Radium-226	-0.187 ± 0.285 (0.747) C:NA T:93%	pCi/L		08/08/18 12:35	
EPA 904.0	Radium-228	0.300 ± 0.527 (1.15) C:61% T:87%	pCi/L		08/08/18 16:28	
Total Radium Calculation	Total Radium	0.300 ± 0.812 (1.90)	pCi/L		08/13/18 15:46	
SM 2540C-2011	Total Dissolved Solids	1250	mg/L	125	07/25/18 16:13	
EPA 300.0 Rev 2.1 1993	Chloride	531	mg/L	11.0	07/25/18 05:09	
EPA 300.0 Rev 2.1 1993	Fluoride	0.12	mg/L	0.10	07/24/18 22:37	
EPA 300.0 Rev 2.1 1993	Sulfate	6.7	mg/L	1.0	07/24/18 22:37	
92392127021	**AMB**					
EPA 903.1	Radium-226	0.130 ± 0.443 (0.855) C:NA T:88%	pCi/L		08/08/18 12:35	
EPA 904.0	Radium-228	1.33 ± 0.744 (1.37) C:60% T:69%	pCi/L		08/08/18 16:28	
Total Radium Calculation	Total Radium	1.46 ± 1.19 (2.23)	pCi/L		08/13/18 15:46	
92392127022	**EQ BLANK**					
EPA 903.1	Radium-226	0.614 ± 0.486 (0.661) C:NA T:92%	pCi/L		08/08/18 12:35	
EPA 904.0	Radium-228	0.407 ± 0.583 (1.25) C:56% T:71%	pCi/L		08/08/18 16:22	
Total Radium Calculation	Total Radium	1.02 ± 1.07 (1.91)	pCi/L		08/13/18 15:46	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: SW-1 **Lab ID: 92392127001** Collected: 07/16/18 10:37 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-36-0	M1
Arsenic	**19.7**	ug/L	10.0	1	07/17/18 22:20	07/19/18 04:55	7440-38-2	
Barium	**979**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-39-3	
Beryllium	**4.6**	ug/L	1.0	1	07/17/18 22:20	07/19/18 04:55	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 04:55	7440-43-9	
Calcium	**10100**	ug/L	100	1	07/17/18 22:20	07/19/18 04:55	7440-70-2	
Chromium	**29.3**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-47-3	
Cobalt	**13.4**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-48-4	
Copper	**28.9**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-50-8	
Lead	**72.4**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7439-98-7	
Nickel	**15.8**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 04:55	7782-49-2	
Silver	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-22-4	
Vanadium	**122**	ug/L	5.0	1	07/17/18 22:20	07/19/18 04:55	7440-62-2	
Zinc	**119**	ug/L	10.0	1	07/17/18 22:20	07/19/18 04:55	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**25.6**	ug/L	10.0	1	07/19/18 14:42	07/23/18 11:11	7440-42-8	M1
Lithium	**22.8**	ug/L	0.50	1	07/19/18 14:42	07/23/18 11:11	7439-93-2	
Thallium	ND	ug/L	0.50	5	07/19/18 14:42	07/24/18 08:48	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/18/18 13:50	07/19/18 12:22	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/21/18 22:30	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/21/18 22:30	107-13-1	
Benzene	ND	ug/L	1.0	1		07/21/18 22:30	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/21/18 22:30	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/21/18 22:30	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/21/18 22:30	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/21/18 22:30	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/21/18 22:30	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/21/18 22:30	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/21/18 22:30	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/21/18 22:30	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/21/18 22:30	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/21/18 22:30	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/21/18 22:30	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/21/18 22:30	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/21/18 22:30	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 22:30	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 22:30	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/21/18 22:30	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/21/18 22:30	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: SW-1 **Lab ID: 92392127001** Collected: 07/16/18 10:37 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/21/18 22:30	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/21/18 22:30	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 22:30	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 22:30	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/21/18 22:30	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 22:30	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 22:30	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/21/18 22:30	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/21/18 22:30	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/21/18 22:30	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/21/18 22:30	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/21/18 22:30	108-10-1	
Styrene	ND	ug/L	1.0	1		07/21/18 22:30	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 22:30	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 22:30	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/21/18 22:30	127-18-4	
Toluene	ND	ug/L	1.0	1		07/21/18 22:30	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/21/18 22:30	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/21/18 22:30	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/21/18 22:30	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/21/18 22:30	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/21/18 22:30	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/21/18 22:30	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/21/18 22:30	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/21/18 22:30	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		07/21/18 22:30	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/21/18 22:30	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/21/18 22:30	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**2200**	mg/L	25.0	1		07/17/18 22:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**12.4**	mg/L	1.0	1		07/19/18 04:41	16887-00-6	
Fluoride	**0.30**	mg/L	0.10	1		07/19/18 04:41	16984-48-8	
Sulfate	**4.7**	mg/L	1.0	1		07/19/18 04:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: BG-1 **Lab ID: 92392127002** Collected: 07/16/18 15:40 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:04	7440-38-2	
Barium	**335**	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:04	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:04	7440-43-9	
Calcium	**28900**	ug/L	100	1	07/17/18 22:20	07/19/18 05:04	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-48-4	
Copper	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-50-8	
Lead	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:04	7782-49-2	
Silver	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:04	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:04	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/19/18 14:42	07/24/18 08:35	7440-42-8	
Lithium	**22.3**	ug/L	0.50	1	07/19/18 14:42	07/24/18 08:35	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/19/18 14:42	07/24/18 08:35	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/18/18 13:50	07/19/18 12:29	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/21/18 22:46	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/21/18 22:46	107-13-1	
Benzene	ND	ug/L	1.0	1		07/21/18 22:46	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/21/18 22:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/21/18 22:46	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/21/18 22:46	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/21/18 22:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/21/18 22:46	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/21/18 22:46	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/21/18 22:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/21/18 22:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/21/18 22:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/21/18 22:46	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/21/18 22:46	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/21/18 22:46	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/21/18 22:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 22:46	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 22:46	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/21/18 22:46	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/21/18 22:46	75-34-3	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: BG-1 **Lab ID: 92392127002** Collected: 07/16/18 15:40 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/21/18 22:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/21/18 22:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 22:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 22:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/21/18 22:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 22:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 22:46	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/21/18 22:46	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/21/18 22:46	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/21/18 22:46	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/21/18 22:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/21/18 22:46	108-10-1	
Styrene	ND	ug/L	1.0	1		07/21/18 22:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 22:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 22:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/21/18 22:46	127-18-4	
Toluene	ND	ug/L	1.0	1		07/21/18 22:46	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/21/18 22:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/21/18 22:46	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/21/18 22:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/21/18 22:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/21/18 22:46	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/21/18 22:46	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/21/18 22:46	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/21/18 22:46	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/21/18 22:46	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	70-130	1		07/21/18 22:46	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		07/21/18 22:46	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**652**	mg/L	50.0	1		07/17/18 22:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**251**	mg/L	5.0	5		07/19/18 06:57	16887-00-6	
Fluoride	**0.14**	mg/L	0.10	1		07/19/18 05:49	16984-48-8	
Sulfate	**18.1**	mg/L	1.0	1		07/19/18 05:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: LEACHATE **Lab ID: 92392127003** Collected: 07/16/18 17:20 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-36-0	
Arsenic	**18.8**	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:07	7440-38-2	
Barium	**85.6**	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:07	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:07	7440-43-9	
Calcium	**268000**	ug/L	500	5	07/17/18 22:20	07/21/18 14:58	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-47-3	
Cobalt	**5.1**	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-48-4	
Copper	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-50-8	
Lead	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7439-92-1	
Molybdenum	**251**	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7439-98-7	
Nickel	**14.7**	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:07	7782-49-2	
Silver	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-22-4	
Vanadium	**6.1**	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:07	7440-62-2	
Zinc	**14.1**	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:07	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**2770**	ug/L	500	50	07/19/18 14:42	07/24/18 08:30	7440-42-8	
Lithium	**40.3**	ug/L	0.50	1	07/19/18 14:42	07/23/18 11:53	7439-93-2	
Thallium	**0.66**	ug/L	0.10	1	07/19/18 14:42	07/23/18 11:53	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/18/18 13:50	07/19/18 12:31	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/21/18 23:02	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/21/18 23:02	107-13-1	
Benzene	ND	ug/L	1.0	1		07/21/18 23:02	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/21/18 23:02	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/21/18 23:02	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/21/18 23:02	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/21/18 23:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/21/18 23:02	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/21/18 23:02	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/21/18 23:02	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/21/18 23:02	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/21/18 23:02	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/21/18 23:02	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/21/18 23:02	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/21/18 23:02	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/21/18 23:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:02	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:02	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/21/18 23:02	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:02	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: LEACHATE **Lab ID: 92392127003** Collected: 07/16/18 17:20 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/21/18 23:02	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:02	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/21/18 23:02	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/21/18 23:02	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/21/18 23:02	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/21/18 23:02	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/21/18 23:02	108-10-1	
Styrene	ND	ug/L	1.0	1		07/21/18 23:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:02	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/21/18 23:02	127-18-4	
Toluene	ND	ug/L	1.0	1		07/21/18 23:02	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:02	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/21/18 23:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/21/18 23:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/21/18 23:02	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/21/18 23:02	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/21/18 23:02	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/21/18 23:02	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	96	%	70-130	1		07/21/18 23:02	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/21/18 23:02	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/21/18 23:02	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**1420**	mg/L	50.0	1		07/17/18 22:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**17.6**	mg/L	1.0	1		07/19/18 06:06	16887-00-6	
Fluoride	**0.18**	mg/L	0.10	1		07/19/18 06:06	16984-48-8	
Sulfate	**525**	mg/L	12.0	12		07/19/18 07:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127004** Collected: 07/16/18 16:30 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:11	7440-38-2	
Barium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:11	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:11	7440-43-9	
Calcium	ND	ug/L	100	1	07/17/18 22:20	07/19/18 05:11	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-48-4	
Copper	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-50-8	
Lead	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:11	7782-49-2	
Silver	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:11	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:11	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/19/18 14:42	07/24/18 08:39	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/19/18 14:42	07/24/18 08:39	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/19/18 14:42	07/24/18 08:39	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/18/18 13:50	07/19/18 12:34	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/21/18 23:19	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/21/18 23:19	107-13-1	
Benzene	ND	ug/L	1.0	1		07/21/18 23:19	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/21/18 23:19	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/21/18 23:19	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/21/18 23:19	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/21/18 23:19	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/21/18 23:19	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/21/18 23:19	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/21/18 23:19	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/21/18 23:19	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/21/18 23:19	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/21/18 23:19	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/21/18 23:19	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/21/18 23:19	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/21/18 23:19	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:19	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:19	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/21/18 23:19	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:19	75-34-3	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127004** Collected: 07/16/18 16:30 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:19	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:19	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:19	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:19	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/21/18 23:19	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:19	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:19	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/21/18 23:19	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/21/18 23:19	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/21/18 23:19	74-88-4	
Methylene Chloride	**5.2**	ug/L	1.0	1		07/21/18 23:19	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/21/18 23:19	108-10-1	
Styrene	ND	ug/L	1.0	1		07/21/18 23:19	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:19	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:19	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/21/18 23:19	127-18-4	
Toluene	ND	ug/L	1.0	1		07/21/18 23:19	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:19	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:19	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/21/18 23:19	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/21/18 23:19	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/21/18 23:19	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/21/18 23:19	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/21/18 23:19	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/21/18 23:19	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/21/18 23:19	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/21/18 23:19	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/21/18 23:19	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/17/18 22:45		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/19/18 06:23	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/19/18 06:23	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/19/18 06:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127005** Collected: 07/16/18 19:00 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:14	7440-38-2	
Barium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:14	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/17/18 22:20	07/19/18 05:14	7440-43-9	
Calcium	ND	ug/L	100	1	07/17/18 22:20	07/19/18 05:14	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-48-4	
Copper	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-50-8	
Lead	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:14	7782-49-2	
Silver	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/17/18 22:20	07/19/18 05:14	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/17/18 22:20	07/19/18 05:14	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/19/18 14:42	07/24/18 08:44	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/19/18 14:42	07/24/18 08:44	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/19/18 14:42	07/24/18 08:44	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/18/18 13:50	07/19/18 12:36	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/21/18 23:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/21/18 23:35	107-13-1	
Benzene	ND	ug/L	1.0	1		07/21/18 23:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/21/18 23:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/21/18 23:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/21/18 23:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/21/18 23:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/21/18 23:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/21/18 23:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/21/18 23:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/21/18 23:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/21/18 23:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/21/18 23:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/21/18 23:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/21/18 23:35	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/21/18 23:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/21/18 23:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:35	75-34-3	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127005** Collected: 07/16/18 19:00 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/21/18 23:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/21/18 23:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/21/18 23:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/21/18 23:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/21/18 23:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/21/18 23:35	108-10-1	
Styrene	ND	ug/L	1.0	1		07/21/18 23:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/21/18 23:35	127-18-4	
Toluene	ND	ug/L	1.0	1		07/21/18 23:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/21/18 23:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/21/18 23:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/21/18 23:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/21/18 23:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/21/18 23:35	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/21/18 23:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	93	%	70-130	1		07/21/18 23:35	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/21/18 23:35	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/21/18 23:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/17/18 22:46		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/19/18 06:40	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/19/18 06:40	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/19/18 06:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127006** Collected: 07/16/18 00:00 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/21/18 23:51	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/21/18 23:51	107-13-1	
Benzene	ND	ug/L	1.0	1		07/21/18 23:51	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/21/18 23:51	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/21/18 23:51	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/21/18 23:51	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/21/18 23:51	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/21/18 23:51	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/21/18 23:51	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/21/18 23:51	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/21/18 23:51	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/21/18 23:51	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/21/18 23:51	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/21/18 23:51	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/21/18 23:51	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/21/18 23:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:51	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/21/18 23:51	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/21/18 23:51	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:51	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/21/18 23:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/21/18 23:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/21/18 23:51	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/21/18 23:51	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/21/18 23:51	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/21/18 23:51	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/21/18 23:51	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/21/18 23:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/21/18 23:51	108-10-1	
Styrene	ND	ug/L	1.0	1		07/21/18 23:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/21/18 23:51	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/21/18 23:51	127-18-4	
Toluene	ND	ug/L	1.0	1		07/21/18 23:51	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/21/18 23:51	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/21/18 23:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/21/18 23:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/21/18 23:51	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/21/18 23:51	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/21/18 23:51	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/21/18 23:51	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/21/18 23:51	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127006** Collected: 07/16/18 00:00 Received: 07/17/18 07:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Surrogates								
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/21/18 23:51	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/21/18 23:51	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-4 **Lab ID: 92392127007** Collected: 07/17/18 09:30 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:14	7440-38-2	
Barium	**306**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:14	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:14	7440-43-9	
Calcium	**65700**	ug/L	100	1	07/19/18 03:30	07/19/18 17:14	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-47-3	
Cobalt	**5.7**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-48-4	
Copper	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-50-8	
Lead	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:14	7782-49-2	
Silver	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:14	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:14	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 17:22	7440-42-8	
Lithium	**26.7**	ug/L	0.50	1	07/23/18 10:15	07/24/18 17:22	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 17:22	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/19/18 12:53	07/20/18 12:36	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 00:07	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 00:07	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 00:07	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 00:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 00:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 00:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 00:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 00:07	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 00:07	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 00:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 00:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 00:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 00:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 00:07	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 00:07	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 00:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:07	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:07	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 00:07	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:07	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-4 **Lab ID: 92392127007** Collected: 07/17/18 09:30 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 00:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:07	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 00:07	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 00:07	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 00:07	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 00:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 00:07	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 00:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 00:07	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 00:07	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 00:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 00:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 00:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 00:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 00:07	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 00:07	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 00:07	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/22/18 00:07	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 00:07	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**1260**	mg/L	125	1		07/19/18 00:30		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**518**	mg/L	10.0	10		07/21/18 09:49	16887-00-6	
Fluoride	**0.30**	mg/L	0.10	1		07/20/18 22:25	16984-48-8	
Sulfate	**10.7**	mg/L	1.0	1		07/20/18 22:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-6 **Lab ID: 92392127008** Collected: 07/17/18 12:05 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:17	7440-38-2	
Barium	**104**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:17	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:17	7440-43-9	
Calcium	**31600**	ug/L	100	1	07/19/18 03:30	07/19/18 17:17	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-48-4	
Copper	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-50-8	
Lead	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:17	7782-49-2	
Silver	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:17	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:17	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:00	7440-42-8	
Lithium	**40.0**	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:00	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:00	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/19/18 12:53	07/20/18 12:44	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 00:24	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 00:24	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 00:24	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 00:24	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 00:24	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 00:24	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 00:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 00:24	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 00:24	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 00:24	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 00:24	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 00:24	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 00:24	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 00:24	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 00:24	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 00:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:24	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:24	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 00:24	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:24	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-6 **Lab ID: 92392127008** Collected: 07/17/18 12:05 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 00:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:24	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 00:24	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 00:24	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 00:24	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 00:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 00:24	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 00:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:24	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 00:24	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 00:24	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:24	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 00:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 00:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 00:24	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 00:24	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 00:24	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 00:24	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		07/22/18 00:24	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/22/18 00:24	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 00:24	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**708**	mg/L	50.0	1		07/19/18 00:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**231**	mg/L	5.0	5		07/21/18 10:06	16887-00-6	
Fluoride	**0.42**	mg/L	0.10	1		07/20/18 22:42	16984-48-8	
Sulfate	**69.7**	mg/L	1.0	1		07/20/18 22:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-3 **Lab ID: 92392127009** Collected: 07/17/18 17:20 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:20	7440-38-2	
Barium	**510**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:20	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:20	7440-43-9	
Calcium	**147000**	ug/L	500	5	07/19/18 03:30	07/21/18 14:48	7440-70-2	
Chromium	**81.4**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-48-4	
Copper	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-50-8	
Lead	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7439-92-1	
Molybdenum	**7.8**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7439-98-7	
Nickel	**49.4**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:20	7782-49-2	
Silver	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:20	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:20	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:05	7440-42-8	
Lithium	**36.7**	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:05	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/19/18 12:53	07/20/18 12:46	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 00:40	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 00:40	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 00:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 00:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 00:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 00:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 00:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 00:40	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 00:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 00:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 00:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 00:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 00:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 00:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 00:40	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 00:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 00:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:40	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-3 **Lab ID: 92392127009** Collected: 07/17/18 17:20 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 00:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 00:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 00:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 00:40	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 00:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 00:40	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 00:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 00:40	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 00:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 00:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 00:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 00:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 00:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 00:40	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 00:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 00:40	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/22/18 00:40	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 00:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**2170**	mg/L	250	1		07/19/18 00:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**1000**	mg/L	20.0	20		07/21/18 10:22	16887-00-6	
Fluoride	**0.57**	mg/L	0.10	1		07/20/18 22:59	16984-48-8	
Sulfate	**88.1**	mg/L	1.0	1		07/20/18 22:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-6 DUPE **Lab ID: 92392127010** Collected: 07/17/18 12:05 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:23	7440-38-2	
Barium	**99.6**	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:23	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:23	7440-43-9	
Calcium	**32000**	ug/L	100	1	07/19/18 03:30	07/19/18 17:23	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-48-4	
Copper	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-50-8	
Lead	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:23	7782-49-2	
Silver	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:23	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:23	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**13.2**	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:09	7440-42-8	
Lithium	**78.5**	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:09	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:09	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/19/18 12:53	07/20/18 12:48	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 00:57	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 00:57	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 00:57	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 00:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 00:57	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 00:57	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 00:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 00:57	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 00:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 00:57	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 00:57	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 00:57	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 00:57	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 00:57	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 00:57	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 00:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 00:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 00:57	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:57	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-6 DUPE **Lab ID: 92392127010** Collected: 07/17/18 12:05 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 00:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 00:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 00:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 00:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 00:57	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 00:57	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 00:57	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 00:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 00:57	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 00:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 00:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 00:57	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 00:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 00:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 00:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 00:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 00:57	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 00:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 00:57	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 00:57	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		07/22/18 00:57	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/22/18 00:57	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 00:57	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**690**	mg/L	50.0	1		07/19/18 00:31		D6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**224**	mg/L	5.0	5		07/21/18 10:39	16887-00-6	
Fluoride	**0.38**	mg/L	0.10	1		07/20/18 23:17	16984-48-8	
Sulfate	**53.4**	mg/L	1.0	1		07/20/18 23:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127011** Collected: 07/17/18 17:00 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:26	7440-38-2	
Barium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:26	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:26	7440-43-9	
Calcium	ND	ug/L	100	1	07/19/18 03:30	07/19/18 17:26	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-48-4	
Copper	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-50-8	
Lead	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:26	7782-49-2	
Silver	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:26	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:26	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:14	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:14	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:14	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/19/18 12:53	07/20/18 12:51	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 01:13	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 01:13	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 01:13	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 01:13	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 01:13	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 01:13	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 01:13	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 01:13	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 01:13	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 01:13	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 01:13	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 01:13	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 01:13	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 01:13	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 01:13	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 01:13	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 01:13	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 01:13	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 01:13	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 01:13	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127011** Collected: 07/17/18 17:00 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 01:13	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:13	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 01:13	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 01:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 01:13	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 01:13	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 01:13	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 01:13	74-88-4	
Methylene Chloride	**5.4**	ug/L	1.0	1		07/22/18 01:13	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 01:13	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 01:13	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 01:13	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 01:13	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 01:13	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 01:13	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 01:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 01:13	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 01:13	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 01:13	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 01:13	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 01:13	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 01:13	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 01:13	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 01:13	460-00-4	
1,2-Dichloroethane-d4 (S)	90	%	70-130	1		07/22/18 01:13	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/22/18 01:13	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/19/18 00:31		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/20/18 23:34	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/20/18 23:34	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/20/18 23:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127012** Collected: 07/17/18 20:20 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:29	7440-38-2	
Barium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:29	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/19/18 03:30	07/19/18 17:29	7440-43-9	
Calcium	ND	ug/L	100	1	07/19/18 03:30	07/19/18 17:29	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-48-4	
Copper	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-50-8	
Lead	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:29	7782-49-2	
Silver	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/19/18 03:30	07/19/18 17:29	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/19/18 03:30	07/19/18 17:29	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:18	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:18	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:18	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/19/18 12:53	07/20/18 12:59	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 01:29	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 01:29	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 01:29	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 01:29	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 01:29	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 01:29	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 01:29	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 01:29	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 01:29	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 01:29	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 01:29	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 01:29	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 01:29	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 01:29	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 01:29	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 01:29	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 01:29	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 01:29	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 01:29	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 01:29	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127012** Collected: 07/17/18 20:20 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 01:29	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:29	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:29	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:29	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 01:29	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 01:29	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 01:29	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 01:29	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 01:29	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 01:29	74-88-4	
Methylene Chloride	**5.4**	ug/L	1.0	1		07/22/18 01:29	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 01:29	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 01:29	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 01:29	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 01:29	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 01:29	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 01:29	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 01:29	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 01:29	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 01:29	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 01:29	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 01:29	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 01:29	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 01:29	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 01:29	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	92	%	70-130	1		07/22/18 01:29	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	70-130	1		07/22/18 01:29	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 01:29	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/19/18 00:32		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/20/18 23:51	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/20/18 23:51	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/20/18 23:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127013** Collected: 07/17/18 00:00 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 01:46	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 01:46	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 01:46	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 01:46	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 01:46	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 01:46	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 01:46	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 01:46	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 01:46	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 01:46	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 01:46	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 01:46	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 01:46	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 01:46	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 01:46	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 01:46	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 01:46	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 01:46	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 01:46	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 01:46	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 01:46	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 01:46	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 01:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 01:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 01:46	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 01:46	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 01:46	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 01:46	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 01:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 01:46	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 01:46	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 01:46	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 01:46	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 01:46	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 01:46	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 01:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 01:46	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 01:46	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 01:46	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 01:46	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 01:46	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 01:46	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 01:46	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 01:46	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127013** Collected: 07/17/18 00:00 Received: 07/18/18 07:11 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Surrogates								
1,2-Dichloroethane-d4 (S)	87	%	70-130	1		07/22/18 01:46	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/22/18 01:46	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-5 **Lab ID: 92392127014** Collected: 07/18/18 10:10 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:06	7440-38-2	
Barium	**101**	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:06	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:06	7440-43-9	
Calcium	**10100**	ug/L	100	1	07/20/18 01:35	07/21/18 18:06	7440-70-2	
Chromium	**5.1**	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-48-4	
Copper	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-50-8	
Lead	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:06	7782-49-2	
Silver	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:06	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:06	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**12.2**	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:23	7440-42-8	
Lithium	**8.9**	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:23	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:23	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/20/18 14:18	07/23/18 11:31	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 02:02	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 02:02	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 02:02	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 02:02	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 02:02	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 02:02	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 02:02	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 02:02	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 02:02	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 02:02	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 02:02	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 02:02	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 02:02	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 02:02	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 02:02	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 02:02	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:02	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:02	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 02:02	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:02	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-5 **Lab ID: 92392127014** Collected: 07/18/18 10:10 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:02	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:02	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:02	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:02	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 02:02	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:02	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:02	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 02:02	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 02:02	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 02:02	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 02:02	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 02:02	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 02:02	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:02	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:02	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 02:02	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 02:02	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:02	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:02	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 02:02	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 02:02	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 02:02	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 02:02	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 02:02	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 02:02	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 02:02	460-00-4	
1,2-Dichloroethane-d4 (S)	86	%	70-130	1		07/22/18 02:02	17060-07-0	
Toluene-d8 (S)	100	%	70-130	1		07/22/18 02:02	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**233**	mg/L	25.0	1		07/19/18 22:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**20.5**	mg/L	1.0	1		07/24/18 15:47	16887-00-6	
Fluoride	**0.47**	mg/L	0.10	1		07/24/18 15:47	16984-48-8	
Sulfate	**4.1**	mg/L	1.0	1		07/24/18 15:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-7R **Lab ID: 92392127015** Collected: 07/18/18 15:00 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:37	7440-38-2	
Barium	**193**	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:37	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:37	7440-43-9	
Calcium	**74000**	ug/L	100	1	07/20/18 01:35	07/21/18 18:37	7440-70-2	
Chromium	**33.7**	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-48-4	
Copper	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-50-8	
Lead	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7439-98-7	
Nickel	**17.4**	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:37	7782-49-2	
Silver	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:37	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:37	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**16.8**	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:27	7440-42-8	
Lithium	**17.8**	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:27	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:27	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/23/18 16:45	07/24/18 13:25	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 02:18	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 02:18	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 02:18	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 02:18	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 02:18	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 02:18	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 02:18	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 02:18	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 02:18	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 02:18	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 02:18	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 02:18	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 02:18	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 02:18	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 02:18	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 02:18	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:18	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:18	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 02:18	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:18	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-7R **Lab ID: 92392127015** Collected: 07/18/18 15:00 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:18	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:18	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:18	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:18	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 02:18	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:18	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:18	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 02:18	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 02:18	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 02:18	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 02:18	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 02:18	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 02:18	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:18	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:18	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 02:18	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 02:18	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:18	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:18	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 02:18	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 02:18	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 02:18	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 02:18	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 02:18	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 02:18	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 02:18	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	70-130	1		07/22/18 02:18	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/22/18 02:18	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**828**	mg/L	50.0	1		07/19/18 22:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**284**	mg/L	6.0	6		07/25/18 02:54	16887-00-6	
Fluoride	**0.13**	mg/L	0.10	1		07/24/18 16:38	16984-48-8	
Sulfate	**20.0**	mg/L	1.0	1		07/24/18 16:38	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127016** Collected: 07/18/18 11:10 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:40	7440-38-2	
Barium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:40	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:40	7440-43-9	
Calcium	ND	ug/L	100	1	07/20/18 01:35	07/21/18 18:40	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-48-4	
Copper	**56.9**	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-50-8	
Lead	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:40	7782-49-2	
Silver	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:40	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:40	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:32	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:32	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:32	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/23/18 16:45	07/24/18 13:32	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 02:35	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 02:35	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 02:35	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 02:35	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 02:35	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 02:35	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 02:35	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 02:35	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 02:35	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 02:35	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 02:35	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 02:35	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 02:35	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 02:35	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 02:35	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 02:35	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:35	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:35	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 02:35	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:35	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127016** Collected: 07/18/18 11:10 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:35	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:35	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:35	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:35	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 02:35	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:35	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:35	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 02:35	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 02:35	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 02:35	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 02:35	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 02:35	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 02:35	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:35	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:35	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 02:35	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 02:35	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:35	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:35	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 02:35	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 02:35	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 02:35	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 02:35	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 02:35	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 02:35	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	95	%	70-130	1		07/22/18 02:35	460-00-4	
1,2-Dichloroethane-d4 (S)	89	%	70-130	1		07/22/18 02:35	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 02:35	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/19/18 22:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**1.4**	mg/L	1.0	1		07/24/18 16:55	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/24/18 16:55	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/24/18 16:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127017** Collected: 07/18/18 12:00 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:43	7440-38-2	
Barium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:43	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/20/18 01:35	07/21/18 18:43	7440-43-9	
Calcium	ND	ug/L	100	1	07/20/18 01:35	07/21/18 18:43	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-48-4	
Copper	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-50-8	
Lead	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:43	7782-49-2	
Silver	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/20/18 01:35	07/21/18 18:43	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/20/18 01:35	07/21/18 18:43	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 18:36	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/23/18 10:15	07/24/18 18:36	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 18:36	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/20/18 14:18	07/23/18 11:34	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 02:51	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 02:51	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 02:51	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 02:51	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 02:51	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 02:51	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 02:51	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 02:51	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 02:51	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 02:51	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 02:51	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 02:51	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 02:51	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 02:51	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 02:51	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 02:51	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:51	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 02:51	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 02:51	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:51	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127017** Collected: 07/18/18 12:00 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 02:51	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:51	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:51	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 02:51	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 02:51	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:51	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 02:51	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 02:51	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 02:51	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 02:51	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 02:51	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 02:51	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 02:51	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:51	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 02:51	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 02:51	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 02:51	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:51	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 02:51	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 02:51	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 02:51	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 02:51	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 02:51	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 02:51	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 02:51	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 02:51	460-00-4	
1,2-Dichloroethane-d4 (S)	87	%	70-130	1		07/22/18 02:51	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 02:51	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/19/18 22:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/24/18 17:12	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/24/18 17:12	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/24/18 17:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127018** Collected: 07/18/18 00:00 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 03:07	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 03:07	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 03:07	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 03:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 03:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 03:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 03:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 03:07	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 03:07	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 03:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 03:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 03:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 03:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 03:07	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 03:07	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 03:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 03:07	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 03:07	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 03:07	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 03:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 03:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 03:07	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 03:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 03:07	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 03:07	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 03:07	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 03:07	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 03:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 03:07	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 03:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 03:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 03:07	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 03:07	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 03:07	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 03:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 03:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 03:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 03:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 03:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 03:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 03:07	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 03:07	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	93	%	70-130	1		07/22/18 03:07	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127018** Collected: 07/18/18 00:00 Received: 07/19/18 07:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Surrogates								
1,2-Dichloroethane-d4 (S)	88	%	70-130	1		07/22/18 03:07	17060-07-0	
Toluene-d8 (S)	102	%	70-130	1		07/22/18 03:07	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-8 **Lab ID: 92392127019** Collected: 07/19/18 10:40 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 00:54	7440-38-2	
Barium	**1020**	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 00:54	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 00:54	7440-43-9	
Calcium	**98100**	ug/L	100	1	07/21/18 02:05	07/23/18 00:54	7440-70-2	M6
Chromium	**16.6**	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-48-4	
Copper	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-50-8	
Lead	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7439-98-7	
Nickel	**10.8**	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 00:54	7782-49-2	
Silver	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 00:54	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 00:54	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	**10.6**	ug/L	10.0	1	07/23/18 10:15	07/24/18 17:27	7440-42-8	
Lithium	**23.5**	ug/L	0.50	1	07/23/18 10:15	07/24/18 17:27	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 17:27	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/22/18 11:37	07/23/18 11:01	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 03:24	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 03:24	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 03:24	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 03:24	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 03:24	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 03:24	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 03:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 03:24	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 03:24	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 03:24	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 03:24	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 03:24	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 03:24	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 03:24	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 03:24	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 03:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 03:24	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 03:24	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 03:24	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 03:24	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-8 **Lab ID: 92392127019** Collected: 07/19/18 10:40 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 03:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 03:24	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 03:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 03:24	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 03:24	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 03:24	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 03:24	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 03:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 03:24	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 03:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 03:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 03:24	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 03:24	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 03:24	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 03:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 03:24	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 03:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 03:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 03:24	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 03:24	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 03:24	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 03:24	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 03:24	460-00-4	
1,2-Dichloroethane-d4 (S)	88	%	70-130	1		07/22/18 03:24	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/22/18 03:24	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**856**	mg/L	50.0	1		07/25/18 16:13		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**355**	mg/L	7.0	7		07/25/18 04:52	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/24/18 22:20	16984-48-8	
Sulfate	**6.7**	mg/L	1.0	1		07/24/18 22:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-1 **Lab ID: 92392127020** Collected: 07/19/18 15:10 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:09	7440-38-2	
Barium	**155**	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 01:09	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 01:09	7440-43-9	
Calcium	**131000**	ug/L	1000	10	07/21/18 02:05	07/23/18 19:53	7440-70-2	
Chromium	**6.8**	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-48-4	
Copper	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-50-8	
Lead	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7439-98-7	
Nickel	**5.6**	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:09	7782-49-2	
Silver	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:09	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:09	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 17:09	7440-42-8	
Lithium	**31.4**	ug/L	0.50	1	07/23/18 10:15	07/24/18 17:09	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 17:09	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/22/18 11:37	07/23/18 11:03	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/22/18 03:40	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/22/18 03:40	107-13-1	
Benzene	ND	ug/L	1.0	1		07/22/18 03:40	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/22/18 03:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/22/18 03:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/22/18 03:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/22/18 03:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/22/18 03:40	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/22/18 03:40	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/22/18 03:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/22/18 03:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/22/18 03:40	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/22/18 03:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/22/18 03:40	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/22/18 03:40	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/22/18 03:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 03:40	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/22/18 03:40	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/22/18 03:40	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/22/18 03:40	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-1 **Lab ID: 92392127020** Collected: 07/19/18 15:10 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/22/18 03:40	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:40	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:40	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/22/18 03:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/22/18 03:40	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 03:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/22/18 03:40	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/22/18 03:40	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/22/18 03:40	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/22/18 03:40	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/22/18 03:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/22/18 03:40	108-10-1	
Styrene	ND	ug/L	1.0	1		07/22/18 03:40	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 03:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/22/18 03:40	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/22/18 03:40	127-18-4	
Toluene	ND	ug/L	1.0	1		07/22/18 03:40	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/22/18 03:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/22/18 03:40	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/22/18 03:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/22/18 03:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/22/18 03:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/22/18 03:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/22/18 03:40	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/22/18 03:40	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	94	%	70-130	1		07/22/18 03:40	460-00-4	
1,2-Dichloroethane-d4 (S)	91	%	70-130	1		07/22/18 03:40	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/22/18 03:40	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	**1250**	mg/L	125	1		07/25/18 16:13		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	**531**	mg/L	11.0	11		07/25/18 05:09	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	1		07/24/18 22:37	16984-48-8	
Sulfate	**6.7**	mg/L	1.0	1		07/24/18 22:37	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127021** Collected: 07/19/18 13:20 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:12	7440-38-2	
Barium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 01:12	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 01:12	7440-43-9	
Calcium	ND	ug/L	100	1	07/21/18 02:05	07/23/18 01:12	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-48-4	
Copper	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-50-8	
Lead	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:12	7782-49-2	
Silver	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:12	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:12	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 17:13	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/23/18 10:15	07/24/18 17:13	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 17:13	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/22/18 11:37	07/23/18 11:05	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/27/18 00:28	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/27/18 00:28	107-13-1	
Benzene	ND	ug/L	1.0	1		07/27/18 00:28	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/27/18 00:28	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/27/18 00:28	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/27/18 00:28	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/27/18 00:28	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/27/18 00:28	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/27/18 00:28	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/27/18 00:28	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/27/18 00:28	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/27/18 00:28	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/27/18 00:28	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/27/18 00:28	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/27/18 00:28	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/27/18 00:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/27/18 00:28	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/27/18 00:28	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/27/18 00:28	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/27/18 00:28	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127021** Collected: 07/19/18 13:20 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/27/18 00:28	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/27/18 00:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/27/18 00:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/27/18 00:28	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/27/18 00:28	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/27/18 00:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/27/18 00:28	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/27/18 00:28	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/27/18 00:28	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/27/18 00:28	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/27/18 00:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/27/18 00:28	108-10-1	
Styrene	ND	ug/L	1.0	1		07/27/18 00:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/27/18 00:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/27/18 00:28	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/27/18 00:28	127-18-4	
Toluene	ND	ug/L	1.0	1		07/27/18 00:28	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/27/18 00:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/27/18 00:28	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/27/18 00:28	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/27/18 00:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/27/18 00:28	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/27/18 00:28	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/27/18 00:28	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/27/18 00:28	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		07/27/18 00:28	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130	1		07/27/18 00:28	17060-07-0	
Toluene-d8 (S)	103	%	70-130	1		07/27/18 00:28	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/25/18 16:13		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/24/18 22:54	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/24/18 22:54	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/24/18 22:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127022** Collected: 07/19/18 18:30 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A							
Antimony	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-36-0	
Arsenic	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:16	7440-38-2	
Barium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-39-3	
Beryllium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 01:16	7440-41-7	
Cadmium	ND	ug/L	1.0	1	07/21/18 02:05	07/23/18 01:16	7440-43-9	
Calcium	ND	ug/L	100	1	07/21/18 02:05	07/23/18 01:16	7440-70-2	
Chromium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-47-3	
Cobalt	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-48-4	
Copper	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-50-8	
Lead	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7439-92-1	
Molybdenum	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7439-98-7	
Nickel	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-02-0	
Selenium	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:16	7782-49-2	
Silver	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-22-4	
Vanadium	ND	ug/L	5.0	1	07/21/18 02:05	07/23/18 01:16	7440-62-2	
Zinc	ND	ug/L	10.0	1	07/21/18 02:05	07/23/18 01:16	7440-66-6	
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3020							
Boron	ND	ug/L	10.0	1	07/23/18 10:15	07/24/18 17:18	7440-42-8	
Lithium	ND	ug/L	0.50	1	07/23/18 10:15	07/24/18 17:18	7439-93-2	
Thallium	ND	ug/L	0.10	1	07/23/18 10:15	07/24/18 17:18	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A							
Mercury	ND	ug/L	0.20	1	07/22/18 11:37	07/23/18 11:08	7439-97-6	
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/26/18 23:55	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/26/18 23:55	107-13-1	
Benzene	ND	ug/L	1.0	1		07/26/18 23:55	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/26/18 23:55	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/26/18 23:55	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/26/18 23:55	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/26/18 23:55	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/26/18 23:55	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/26/18 23:55	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/26/18 23:55	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/26/18 23:55	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/26/18 23:55	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/26/18 23:55	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/26/18 23:55	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/26/18 23:55	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/26/18 23:55	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/26/18 23:55	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/26/18 23:55	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/26/18 23:55	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/26/18 23:55	75-34-3	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127022** Collected: 07/19/18 18:30 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
1,2-Dichloroethane	ND	ug/L	1.0	1		07/26/18 23:55	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/26/18 23:55	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/26/18 23:55	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/26/18 23:55	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/26/18 23:55	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/26/18 23:55	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/26/18 23:55	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/26/18 23:55	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/26/18 23:55	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/26/18 23:55	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/26/18 23:55	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/26/18 23:55	108-10-1	
Styrene	ND	ug/L	1.0	1		07/26/18 23:55	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/26/18 23:55	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/26/18 23:55	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/26/18 23:55	127-18-4	
Toluene	ND	ug/L	1.0	1		07/26/18 23:55	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/26/18 23:55	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/26/18 23:55	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/26/18 23:55	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/26/18 23:55	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/26/18 23:55	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/26/18 23:55	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/26/18 23:55	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/26/18 23:55	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	98	%	70-130	1		07/26/18 23:55	460-00-4	
1,2-Dichloroethane-d4 (S)	101	%	70-130	1		07/26/18 23:55	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/26/18 23:55	2037-26-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011							
Total Dissolved Solids	ND	mg/L	25.0	1		07/25/18 16:16		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993							
Chloride	ND	mg/L	1.0	1		07/24/18 23:11	16887-00-6	
Fluoride	ND	mg/L	0.10	1		07/24/18 23:11	16984-48-8	
Sulfate	ND	mg/L	1.0	1		07/24/18 23:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127023** Collected: 07/19/18 00:00 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		07/27/18 00:11	67-64-1	
Acrylonitrile	ND	ug/L	10.0	1		07/27/18 00:11	107-13-1	
Benzene	ND	ug/L	1.0	1		07/27/18 00:11	71-43-2	
Bromochloromethane	ND	ug/L	1.0	1		07/27/18 00:11	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		07/27/18 00:11	75-27-4	
Bromoform	ND	ug/L	1.0	1		07/27/18 00:11	75-25-2	
Bromomethane	ND	ug/L	2.0	1		07/27/18 00:11	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		07/27/18 00:11	78-93-3	
Carbon disulfide	ND	ug/L	2.0	1		07/27/18 00:11	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	1		07/27/18 00:11	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		07/27/18 00:11	108-90-7	
Chloroethane	ND	ug/L	1.0	1		07/27/18 00:11	75-00-3	
Chloroform	ND	ug/L	1.0	1		07/27/18 00:11	67-66-3	
Chloromethane	ND	ug/L	1.0	1		07/27/18 00:11	74-87-3	
Dibromochloromethane	ND	ug/L	1.0	1		07/27/18 00:11	124-48-1	
Dibromomethane	ND	ug/L	1.0	1		07/27/18 00:11	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		07/27/18 00:11	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		07/27/18 00:11	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	1.0	1		07/27/18 00:11	110-57-6	
1,1-Dichloroethane	ND	ug/L	1.0	1		07/27/18 00:11	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		07/27/18 00:11	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		07/27/18 00:11	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		07/27/18 00:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		07/27/18 00:11	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		07/27/18 00:11	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		07/27/18 00:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		07/27/18 00:11	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	1		07/27/18 00:11	100-41-4	
2-Hexanone	ND	ug/L	5.0	1		07/27/18 00:11	591-78-6	
Iodomethane	ND	ug/L	5.0	1		07/27/18 00:11	74-88-4	
Methylene Chloride	ND	ug/L	1.0	1		07/27/18 00:11	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		07/27/18 00:11	108-10-1	
Styrene	ND	ug/L	1.0	1		07/27/18 00:11	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		07/27/18 00:11	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		07/27/18 00:11	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		07/27/18 00:11	127-18-4	
Toluene	ND	ug/L	1.0	1		07/27/18 00:11	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		07/27/18 00:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		07/27/18 00:11	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		07/27/18 00:11	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		07/27/18 00:11	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		07/27/18 00:11	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		07/27/18 00:11	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		07/27/18 00:11	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1		07/27/18 00:11	1330-20-7	
Surrogates								
4-Bromofluorobenzene (S)	100	%	70-130	1		07/27/18 00:11	460-00-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: TRIP BLANK **Lab ID: 92392127023** Collected: 07/19/18 00:00 Received: 07/20/18 08:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level Landfill	Analytical Method: EPA 8260B							
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	1		07/27/18 00:11	17060-07-0	
Toluene-d8 (S)	101	%	70-130	1		07/27/18 00:11	2037-26-5	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 419757 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 2326144 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/19/18 12:17	

LABORATORY CONTROL SAMPLE: 2326145

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2326146 2326147

Parameter	Units	92392127002 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	2.6	92	102	75-125	9	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420010 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

METHOD BLANK: 2327391 Matrix: Water
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/20/18 12:32	

LABORATORY CONTROL SAMPLE: 2327392

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: 2327393 2327394

Parameter	Units	92392127007 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	2.2	90	88	75-125	2	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420288 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92392127014, 92392127017

METHOD BLANK: 2328553 Matrix: Water
Associated Lab Samples: 92392127014, 92392127017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/23/18 11:10	

LABORATORY CONTROL SAMPLE: 2328554

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.8	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2328555 2328556

Parameter	Units	92392371004 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	102	103	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420486 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 2329538 Matrix: Water
Associated Lab Samples: 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/23/18 10:21	

LABORATORY CONTROL SAMPLE: 2329539

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2329540 2329541

Parameter	Units	92392634002 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	2.6	97	102	75-125	6	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420574 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92392127015, 92392127016

METHOD BLANK: 2329864 Matrix: Water
Associated Lab Samples: 92392127015, 92392127016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/24/18 13:20	

LABORATORY CONTROL SAMPLE: 2329865

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.2	87	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2329866 2329867

Parameter	Units	92392127015 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	2.2	89	89	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 419650 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 2325701 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/19/18 04:43	
Arsenic	ug/L	ND	10.0	07/19/18 04:43	
Barium	ug/L	ND	5.0	07/19/18 04:43	
Beryllium	ug/L	ND	1.0	07/19/18 04:43	
Cadmium	ug/L	ND	1.0	07/19/18 04:43	
Calcium	ug/L	ND	100	07/19/18 04:43	
Chromium	ug/L	ND	5.0	07/19/18 04:43	
Cobalt	ug/L	ND	5.0	07/19/18 04:43	
Copper	ug/L	ND	5.0	07/19/18 04:43	
Lead	ug/L	ND	5.0	07/19/18 04:43	
Molybdenum	ug/L	ND	5.0	07/19/18 04:43	
Nickel	ug/L	ND	5.0	07/19/18 04:43	
Selenium	ug/L	ND	10.0	07/19/18 04:43	
Silver	ug/L	ND	5.0	07/19/18 04:43	
Vanadium	ug/L	ND	5.0	07/19/18 04:43	
Zinc	ug/L	ND	10.0	07/19/18 04:43	

LABORATORY CONTROL SAMPLE: 2325702

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	527	105	80-120	
Arsenic	ug/L	500	502	100	80-120	
Barium	ug/L	500	529	106	80-120	
Beryllium	ug/L	500	528	106	80-120	
Cadmium	ug/L	500	516	103	80-120	
Calcium	ug/L	5000	5190	104	80-120	
Chromium	ug/L	500	515	103	80-120	
Cobalt	ug/L	500	511	102	80-120	
Copper	ug/L	500	532	106	80-120	
Lead	ug/L	500	500	100	80-120	
Molybdenum	ug/L	500	537	107	80-120	
Nickel	ug/L	500	509	102	80-120	
Selenium	ug/L	500	504	101	80-120	
Silver	ug/L	250	261	104	80-120	
Vanadium	ug/L	500	513	103	80-120	
Zinc	ug/L	500	492	98	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2325703 2325704

Parameter	Units	92392127001 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	191	199	38	39	75-125	4	20	M1
Arsenic	ug/L	19.7	500	500	440	434	84	83	75-125	1	20	
Barium	ug/L	979	500	500	1520	1480	109	101	75-125	3	20	
Beryllium	ug/L	4.6	500	500	466	461	92	91	75-125	1	20	
Cadmium	ug/L	ND	500	500	450	442	90	88	75-125	2	20	
Calcium	ug/L	10100	5000	5000	14700	14000	91	79	75-125	4	20	
Chromium	ug/L	29.3	500	500	486	479	91	90	75-125	1	20	
Cobalt	ug/L	13.4	500	500	449	443	87	86	75-125	1	20	
Copper	ug/L	28.9	500	500	505	500	95	94	75-125	1	20	
Lead	ug/L	72.4	500	500	493	486	84	83	75-125	1	20	
Molybdenum	ug/L	ND	500	500	401	399	80	79	75-125	0	20	
Nickel	ug/L	15.8	500	500	450	444	87	86	75-125	1	20	
Selenium	ug/L	ND	500	500	394	390	79	78	75-125	1	20	
Silver	ug/L	ND	250	250	228	227	91	91	75-125	1	20	
Vanadium	ug/L	122	500	500	584	574	93	90	75-125	2	20	
Zinc	ug/L	119	500	500	567	562	90	89	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 419903 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

METHOD BLANK: 2326953 Matrix: Water
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/19/18 16:42	
Arsenic	ug/L	ND	10.0	07/19/18 16:42	
Barium	ug/L	ND	5.0	07/19/18 16:42	
Beryllium	ug/L	ND	1.0	07/19/18 16:42	
Cadmium	ug/L	ND	1.0	07/19/18 16:42	
Calcium	ug/L	ND	100	07/19/18 16:42	
Chromium	ug/L	ND	5.0	07/19/18 16:42	
Cobalt	ug/L	ND	5.0	07/19/18 16:42	
Copper	ug/L	ND	5.0	07/19/18 16:42	
Lead	ug/L	ND	5.0	07/19/18 16:42	
Molybdenum	ug/L	ND	5.0	07/19/18 16:42	
Nickel	ug/L	ND	5.0	07/19/18 16:42	
Selenium	ug/L	ND	10.0	07/19/18 16:42	
Silver	ug/L	ND	5.0	07/19/18 16:42	
Vanadium	ug/L	ND	5.0	07/19/18 16:42	
Zinc	ug/L	ND	10.0	07/19/18 16:42	

LABORATORY CONTROL SAMPLE: 2326954

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	471	94	80-120	
Arsenic	ug/L	500	470	94	80-120	
Barium	ug/L	500	481	96	80-120	
Beryllium	ug/L	500	480	96	80-120	
Cadmium	ug/L	500	487	97	80-120	
Calcium	ug/L	5000	4920	98	80-120	
Chromium	ug/L	500	480	96	80-120	
Cobalt	ug/L	500	479	96	80-120	
Copper	ug/L	500	499	100	80-120	
Lead	ug/L	500	467	93	80-120	
Molybdenum	ug/L	500	497	99	80-120	
Nickel	ug/L	500	474	95	80-120	
Selenium	ug/L	500	442	88	80-120	
Silver	ug/L	250	249	100	80-120	
Vanadium	ug/L	500	495	99	80-120	
Zinc	ug/L	500	474	95	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2326955 2326956

Parameter	Units	92392371004 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	485	96	97	75-125	1	20	
Arsenic	ug/L	ND	500	500	479	486	96	97	75-125	1	20	
Barium	ug/L	4.3J	500	500	470	475	93	94	75-125	1	20	
Beryllium	ug/L	ND	500	500	484	490	97	98	75-125	1	20	
Cadmium	ug/L	ND	500	500	467	473	93	95	75-125	1	20	
Calcium	ug/L	29800	5000	5000	36300	36000	130	124	75-125	1	20	M0
Chromium	ug/L	ND	500	500	466	474	93	95	75-125	2	20	
Cobalt	ug/L	ND	500	500	456	464	91	93	75-125	2	20	
Copper	ug/L	ND	500	500	490	497	98	99	75-125	1	20	
Lead	ug/L	ND	500	500	451	456	90	91	75-125	1	20	
Molybdenum	ug/L	ND	500	500	486	493	97	99	75-125	1	20	
Nickel	ug/L	ND	500	500	450	457	90	91	75-125	2	20	
Selenium	ug/L	ND	500	500	470	474	94	95	75-125	1	20	
Silver	ug/L	ND	250	250	245	249	98	100	75-125	2	20	
Vanadium	ug/L	ND	500	500	491	497	98	99	75-125	1	20	
Zinc	ug/L	ND	500	500	457	464	91	92	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420174 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017

METHOD BLANK: 2328086 Matrix: Water
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/21/18 17:59	
Arsenic	ug/L	ND	10.0	07/21/18 17:59	
Barium	ug/L	ND	5.0	07/21/18 17:59	
Beryllium	ug/L	ND	1.0	07/21/18 17:59	
Cadmium	ug/L	ND	1.0	07/21/18 17:59	
Calcium	ug/L	ND	100	07/21/18 17:59	
Chromium	ug/L	ND	5.0	07/21/18 17:59	
Cobalt	ug/L	ND	5.0	07/21/18 17:59	
Copper	ug/L	ND	5.0	07/21/18 17:59	
Lead	ug/L	ND	5.0	07/21/18 17:59	
Molybdenum	ug/L	ND	5.0	07/21/18 17:59	
Nickel	ug/L	ND	5.0	07/21/18 17:59	
Selenium	ug/L	ND	10.0	07/21/18 17:59	
Silver	ug/L	ND	5.0	07/21/18 17:59	
Vanadium	ug/L	ND	5.0	07/21/18 17:59	
Zinc	ug/L	ND	10.0	07/21/18 17:59	

LABORATORY CONTROL SAMPLE: 2328087

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	475	95	80-120	
Arsenic	ug/L	500	452	90	80-120	
Barium	ug/L	500	483	97	80-120	
Beryllium	ug/L	500	480	96	80-120	
Cadmium	ug/L	500	477	95	80-120	
Calcium	ug/L	5000	4680	94	80-120	
Chromium	ug/L	500	490	98	80-120	
Cobalt	ug/L	500	464	93	80-120	
Copper	ug/L	500	501	100	80-120	
Lead	ug/L	500	456	91	80-120	
Molybdenum	ug/L	500	492	98	80-120	
Nickel	ug/L	500	471	94	80-120	
Selenium	ug/L	500	465	93	80-120	
Silver	ug/L	250	244	98	80-120	
Vanadium	ug/L	500	481	96	80-120	
Zinc	ug/L	500	439	88	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2328088 2328089

Parameter	Units	92392127014 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	456	481	91	96	75-125	5	20	
Arsenic	ug/L	ND	500	500	437	459	87	91	75-125	5	20	
Barium	ug/L	101	500	500	561	584	92	97	75-125	4	20	
Beryllium	ug/L	ND	500	500	465	483	93	97	75-125	4	20	
Cadmium	ug/L	ND	500	500	460	483	92	97	75-125	5	20	
Calcium	ug/L	10100	5000	5000	14500	15200	88	101	75-125	4	20	
Chromium	ug/L	5.1	500	500	479	492	95	97	75-125	3	20	
Cobalt	ug/L	ND	500	500	437	460	87	92	75-125	5	20	
Copper	ug/L	ND	500	500	477	494	95	99	75-125	3	20	
Lead	ug/L	ND	500	500	428	450	86	90	75-125	5	20	
Molybdenum	ug/L	ND	500	500	469	493	94	98	75-125	5	20	
Nickel	ug/L	ND	500	500	448	471	89	93	75-125	5	20	
Selenium	ug/L	ND	500	500	452	475	90	95	75-125	5	20	
Silver	ug/L	ND	250	250	234	242	93	97	75-125	3	20	
Vanadium	ug/L	ND	500	500	468	486	94	97	75-125	4	20	
Zinc	ug/L	ND	500	500	427	450	85	90	75-125	5	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420420 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 2329301 Matrix: Water
Associated Lab Samples: 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	07/23/18 00:48	
Arsenic	ug/L	ND	10.0	07/23/18 00:48	
Barium	ug/L	ND	5.0	07/23/18 00:48	
Beryllium	ug/L	ND	1.0	07/23/18 00:48	
Cadmium	ug/L	ND	1.0	07/23/18 00:48	
Calcium	ug/L	ND	100	07/23/18 00:48	
Chromium	ug/L	ND	5.0	07/23/18 00:48	
Cobalt	ug/L	ND	5.0	07/23/18 00:48	
Copper	ug/L	ND	5.0	07/23/18 00:48	
Lead	ug/L	ND	5.0	07/23/18 00:48	
Molybdenum	ug/L	ND	5.0	07/23/18 00:48	
Nickel	ug/L	ND	5.0	07/23/18 00:48	
Selenium	ug/L	ND	10.0	07/23/18 00:48	
Silver	ug/L	ND	5.0	07/23/18 00:48	
Vanadium	ug/L	ND	5.0	07/23/18 00:48	
Zinc	ug/L	ND	10.0	07/23/18 00:48	

LABORATORY CONTROL SAMPLE: 2329302

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	488	98	80-120	
Arsenic	ug/L	500	480	96	80-120	
Barium	ug/L	500	482	96	80-120	
Beryllium	ug/L	500	478	96	80-120	
Cadmium	ug/L	500	472	94	80-120	
Calcium	ug/L	5000	4770	95	80-120	
Chromium	ug/L	500	471	94	80-120	
Cobalt	ug/L	500	472	94	80-120	
Copper	ug/L	500	491	98	80-120	
Lead	ug/L	500	464	93	80-120	
Molybdenum	ug/L	500	493	99	80-120	
Nickel	ug/L	500	467	93	80-120	
Selenium	ug/L	500	470	94	80-120	
Silver	ug/L	250	243	97	80-120	
Vanadium	ug/L	500	469	94	80-120	
Zinc	ug/L	500	473	95	80-120	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2329303 2329304

Parameter	Units	92392127019 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	494	492	99	98	75-125	0	20	
Arsenic	ug/L	ND	500	500	491	488	98	98	75-125	1	20	
Barium	ug/L	1020	500	500	1500	1500	96	95	75-125	1	20	
Beryllium	ug/L	ND	500	500	485	483	97	97	75-125	0	20	
Cadmium	ug/L	ND	500	500	481	478	96	96	75-125	1	20	
Calcium	ug/L	98100	5000	5000	96200	97500	-37	-12	75-125	1	20	M6
Chromium	ug/L	16.6	500	500	486	485	94	94	75-125	0	20	
Cobalt	ug/L	ND	500	500	455	452	91	90	75-125	1	20	
Copper	ug/L	ND	500	500	496	493	99	98	75-125	1	20	
Lead	ug/L	ND	500	500	450	448	90	90	75-125	0	20	
Molybdenum	ug/L	ND	500	500	496	494	99	99	75-125	0	20	
Nickel	ug/L	10.8	500	500	460	458	90	89	75-125	0	20	
Selenium	ug/L	ND	500	500	486	480	97	96	75-125	1	20	
Silver	ug/L	ND	250	250	250	247	100	98	75-125	1	20	
Vanadium	ug/L	ND	500	500	478	475	95	95	75-125	0	20	
Zinc	ug/L	ND	500	500	459	455	91	91	75-125	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 551351 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 2996048 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	10.0	07/23/18 11:06	
Lithium	ug/L	ND	0.50	07/23/18 11:06	
Thallium	ug/L	ND	0.10	07/23/18 11:06	

LABORATORY CONTROL SAMPLE: 2996049

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	93.0	93	80-120	
Lithium	ug/L	100	102	102	80-120	
Thallium	ug/L	100	98.7	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2996050 2996051

Parameter	Units	92392127001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	25.6	100	100	105	99.9	79	74	75-125	5	20	M1
Lithium	ug/L	22.8	100	100	117	114	94	91	75-125	3	20	
Thallium	ug/L	ND	100	100	90.2	87.5	90	87	75-125	3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 551856 Analysis Method: EPA 6020B
QC Batch Method: EPA 3020 Analysis Description: 6020B Water UPD5
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012, 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 2999151 Matrix: Water
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012, 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	10.0	07/24/18 17:04	
Lithium	ug/L	ND	0.50	07/24/18 17:04	
Thallium	ug/L	ND	0.10	07/24/18 17:04	

LABORATORY CONTROL SAMPLE: 2999152

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	99.5	99	80-120	
Lithium	ug/L	100	103	103	80-120	
Thallium	ug/L	100	97.1	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2999153 2999154

Parameter	Units	92392127019 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	10.6	100	100	108	113	97	102	75-125	4	20	
Lithium	ug/L	23.5	100	100	124	123	101	100	75-125	1	20	
Thallium	ug/L	ND	100	100	94.6	94.2	95	94	75-125	0	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420460 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005, 92392127006, 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012, 92392127013, 92392127014, 92392127015, 92392127016, 92392127017, 92392127018, 92392127019, 92392127020

METHOD BLANK: 2329456 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005, 92392127006, 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012, 92392127013, 92392127014, 92392127015, 92392127016, 92392127017, 92392127018, 92392127019, 92392127020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	07/21/18 21:57	
1,1,1-Trichloroethane	ug/L	ND	1.0	07/21/18 21:57	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	07/21/18 21:57	
1,1,2-Trichloroethane	ug/L	ND	1.0	07/21/18 21:57	
1,1-Dichloroethane	ug/L	ND	1.0	07/21/18 21:57	
1,1-Dichloroethene	ug/L	ND	1.0	07/21/18 21:57	
1,2,3-Trichloropropane	ug/L	ND	1.0	07/21/18 21:57	
1,2-Dichlorobenzene	ug/L	ND	1.0	07/21/18 21:57	
1,2-Dichloroethane	ug/L	ND	1.0	07/21/18 21:57	
1,2-Dichloropropane	ug/L	ND	1.0	07/21/18 21:57	
1,4-Dichlorobenzene	ug/L	ND	1.0	07/21/18 21:57	
2-Butanone (MEK)	ug/L	ND	5.0	07/21/18 21:57	
2-Hexanone	ug/L	ND	5.0	07/21/18 21:57	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	07/21/18 21:57	
Acetone	ug/L	ND	25.0	07/21/18 21:57	
Acrylonitrile	ug/L	ND	10.0	07/21/18 21:57	
Benzene	ug/L	ND	1.0	07/21/18 21:57	
Bromochloromethane	ug/L	ND	1.0	07/21/18 21:57	
Bromodichloromethane	ug/L	ND	1.0	07/21/18 21:57	
Bromoform	ug/L	ND	1.0	07/21/18 21:57	
Bromomethane	ug/L	ND	2.0	07/21/18 21:57	
Carbon disulfide	ug/L	ND	2.0	07/21/18 21:57	
Carbon tetrachloride	ug/L	ND	1.0	07/21/18 21:57	
Chlorobenzene	ug/L	ND	1.0	07/21/18 21:57	
Chloroethane	ug/L	ND	1.0	07/21/18 21:57	
Chloroform	ug/L	ND	1.0	07/21/18 21:57	
Chloromethane	ug/L	ND	1.0	07/21/18 21:57	
cis-1,2-Dichloroethene	ug/L	ND	1.0	07/21/18 21:57	
cis-1,3-Dichloropropene	ug/L	ND	1.0	07/21/18 21:57	
Dibromochloromethane	ug/L	ND	1.0	07/21/18 21:57	
Dibromomethane	ug/L	ND	1.0	07/21/18 21:57	
Ethylbenzene	ug/L	ND	1.0	07/21/18 21:57	
Iodomethane	ug/L	ND	5.0	07/21/18 21:57	
Methylene Chloride	ug/L	ND	1.0	07/21/18 21:57	
Styrene	ug/L	ND	1.0	07/21/18 21:57	
Tetrachloroethene	ug/L	ND	1.0	07/21/18 21:57	
Toluene	ug/L	ND	1.0	07/21/18 21:57	
trans-1,2-Dichloroethene	ug/L	ND	1.0	07/21/18 21:57	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

METHOD BLANK: 2329456 Matrix: Water

Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005, 92392127006, 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012, 92392127013, 92392127014, 92392127015, 92392127016, 92392127017, 92392127018, 92392127019, 92392127020

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
trans-1,3-Dichloropropene	ug/L	ND	1.0	07/21/18 21:57	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	07/21/18 21:57	
Trichloroethene	ug/L	ND	1.0	07/21/18 21:57	
Trichlorofluoromethane	ug/L	ND	1.0	07/21/18 21:57	
Vinyl acetate	ug/L	ND	2.0	07/21/18 21:57	
Vinyl chloride	ug/L	ND	1.0	07/21/18 21:57	
Xylene (Total)	ug/L	ND	1.0	07/21/18 21:57	
1,2-Dichloroethane-d4 (S)	%	88	70-130	07/21/18 21:57	
4-Bromofluorobenzene (S)	%	94	70-130	07/21/18 21:57	
Toluene-d8 (S)	%	101	70-130	07/21/18 21:57	

LABORATORY CONTROL SAMPLE: 2329457

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.1	96	80-125	
1,1,1-Trichloroethane	ug/L	50	42.5	85	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	44.9	90	79-124	
1,1,2-Trichloroethane	ug/L	50	46.3	93	85-125	
1,1-Dichloroethane	ug/L	50	41.3	83	73-126	
1,1-Dichloroethene	ug/L	50	45.4	91	66-135	
1,2,3-Trichloropropane	ug/L	50	42.7	85	75-130	
1,2-Dichlorobenzene	ug/L	50	44.3	89	80-133	
1,2-Dichloroethane	ug/L	50	38.7	77	67-128	
1,2-Dichloropropane	ug/L	50	45.4	91	75-132	
1,4-Dichlorobenzene	ug/L	50	44.0	88	78-130	
2-Butanone (MEK)	ug/L	100	75.3	75	61-144	
2-Hexanone	ug/L	100	81.8	82	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	84.9	85	72-135	
Acetone	ug/L	100	87.1	87	48-146	
Acrylonitrile	ug/L	250	204	82	40-160	
Benzene	ug/L	50	45.8	92	80-125	
Bromochloromethane	ug/L	50	44.3	89	71-125	
Bromodichloromethane	ug/L	50	49.0	98	78-124	
Bromoform	ug/L	50	51.2	102	71-128	
Bromomethane	ug/L	50	39.4	79	40-160	
Carbon disulfide	ug/L	50	44.7	89	50-160	
Carbon tetrachloride	ug/L	50	45.9	92	69-131	
Chlorobenzene	ug/L	50	45.4	91	81-122	
Chloroethane	ug/L	50	29.1	58	39-148	
Chloroform	ug/L	50	45.7	91	73-127	
Chloromethane	ug/L	50	38.7	77	44-146	
cis-1,2-Dichloroethene	ug/L	50	42.3	85	74-124	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

LABORATORY CONTROL SAMPLE: 2329457

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,3-Dichloropropene	ug/L	50	47.1	94	72-132	
Dibromochloromethane	ug/L	50	48.6	97	78-125	
Dibromomethane	ug/L	50	50.7	101	82-120	
Ethylbenzene	ug/L	50	45.8	92	79-121	
Iodomethane	ug/L	100	92.3	92	39-154	
Methylene Chloride	ug/L	50	44.9	90	64-133	
Styrene	ug/L	50	45.4	91	84-126	
Tetrachloroethene	ug/L	50	46.3	93	78-122	
Toluene	ug/L	50	45.5	91	80-121	
trans-1,2-Dichloroethene	ug/L	50	44.5	89	71-127	
trans-1,3-Dichloropropene	ug/L	50	48.2	96	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	47.3	95	40-160	
Trichloroethene	ug/L	50	46.4	93	78-122	
Trichlorofluoromethane	ug/L	50	46.7	93	53-137	
Vinyl acetate	ug/L	100	82.1	82	40-160	
Vinyl chloride	ug/L	50	47.4	95	58-137	
Xylene (Total)	ug/L	150	137	91	81-126	
1,2-Dichloroethane-d4 (S)	%			88	70-130	
4-Bromofluorobenzene (S)	%			97	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE SAMPLE: 2329459

Parameter	Units	92392127009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	20	23.0	115	70-130	
1,1,1-Trichloroethane	ug/L	ND	20	23.4	117	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	22.5	113	70-130	
1,1,2-Trichloroethane	ug/L	ND	20	21.9	109	70-130	
1,1-Dichloroethane	ug/L	ND	20	22.1	111	70-130	
1,1-Dichloroethene	ug/L	ND	20	25.7	128	70-166	
1,2,3-Trichloropropane	ug/L	ND	20	21.6	108	70-130	
1,2-Dichlorobenzene	ug/L	ND	20	21.8	109	70-130	
1,2-Dichloroethane	ug/L	ND	20	21.2	106	70-130	
1,2-Dichloropropane	ug/L	ND	20	22.5	112	70-130	
1,4-Dichlorobenzene	ug/L	ND	20	21.7	108	70-130	
2-Butanone (MEK)	ug/L	ND	40	44.3	111	70-130	
2-Hexanone	ug/L	ND	40	44.6	112	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	43.0	108	70-130	
Acetone	ug/L	ND	40	46.4	116	70-130	
Acrylonitrile	ug/L	ND	100	111	111	70-130	
Benzene	ug/L	ND	20	23.1	116	70-148	
Bromochloromethane	ug/L	ND	20	21.8	109	70-130	
Bromodichloromethane	ug/L	ND	20	23.3	117	70-130	
Bromoform	ug/L	ND	20	22.7	114	70-130	
Bromomethane	ug/L	ND	20	17.4	87	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

MATRIX SPIKE SAMPLE: 2329459

Parameter	Units	92392127009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Carbon disulfide	ug/L	ND	20	23.8	119	70-130	
Carbon tetrachloride	ug/L	ND	20	24.3	122	70-130	
Chlorobenzene	ug/L	ND	20	22.2	111	70-146	
Chloroethane	ug/L	ND	20	21.4	107	70-130	
Chloroform	ug/L	ND	20	23.3	116	70-130	
Chloromethane	ug/L	ND	20	20.7	103	70-130	
cis-1,2-Dichloroethene	ug/L	ND	20	23.0	115	70-130	
cis-1,3-Dichloropropene	ug/L	ND	20	22.9	114	70-130	
Dibromochloromethane	ug/L	ND	20	23.3	116	70-130	
Dibromomethane	ug/L	ND	20	22.2	111	70-130	
Ethylbenzene	ug/L	ND	20	22.9	115	70-130	
Iodomethane	ug/L	ND	40	38.3	96	70-130	
Methylene Chloride	ug/L	ND	20	14.1	70	70-130	
Styrene	ug/L	ND	20	20.2	101	70-130	
Tetrachloroethene	ug/L	ND	20	21.6	108	70-130	
Toluene	ug/L	ND	20	22.1	111	70-155	
trans-1,2-Dichloroethene	ug/L	ND	20	23.4	117	70-130	
trans-1,3-Dichloropropene	ug/L	ND	20	22.5	113	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	20	21.1	106	70-130	
Trichloroethene	ug/L	ND	20	22.7	114	69-151	
Trichlorofluoromethane	ug/L	ND	20	25.6	128	70-130	
Vinyl acetate	ug/L	ND	40	45.3	113	70-130	
Vinyl chloride	ug/L	ND	20	25.0	125	70-130	
Xylene (Total)	ug/L	ND	60	67.3	112	70-130	
1,2-Dichloroethane-d4 (S)	%				101	70-130	
4-Bromofluorobenzene (S)	%				102	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 2329458

Parameter	Units	92392127008 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

SAMPLE DUPLICATE: 2329458

Parameter	Units	92392127008 Result	Dup Result	RPD	Max RPD	Qualifiers
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	
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)	%	89	102	14		
4-Bromofluorobenzene (S)	%	95	100	6		
Toluene-d8 (S)	%	102	101	1		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 421362 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV Low Level Landfill
Associated Lab Samples: 92392127021, 92392127022, 92392127023

METHOD BLANK: 2333717 Matrix: Water
Associated Lab Samples: 92392127021, 92392127022, 92392127023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	07/26/18 19:52	
1,1,1-Trichloroethane	ug/L	ND	1.0	07/26/18 19:52	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	07/26/18 19:52	
1,1,2-Trichloroethane	ug/L	ND	1.0	07/26/18 19:52	
1,1-Dichloroethane	ug/L	ND	1.0	07/26/18 19:52	
1,1-Dichloroethene	ug/L	ND	1.0	07/26/18 19:52	
1,2,3-Trichloropropane	ug/L	ND	1.0	07/26/18 19:52	
1,2-Dichlorobenzene	ug/L	ND	1.0	07/26/18 19:52	
1,2-Dichloroethane	ug/L	ND	1.0	07/26/18 19:52	
1,2-Dichloropropane	ug/L	ND	1.0	07/26/18 19:52	
1,4-Dichlorobenzene	ug/L	ND	1.0	07/26/18 19:52	
2-Butanone (MEK)	ug/L	ND	5.0	07/26/18 19:52	
2-Hexanone	ug/L	ND	5.0	07/26/18 19:52	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	07/26/18 19:52	
Acetone	ug/L	ND	25.0	07/26/18 19:52	
Acrylonitrile	ug/L	ND	10.0	07/26/18 19:52	
Benzene	ug/L	ND	1.0	07/26/18 19:52	
Bromochloromethane	ug/L	ND	1.0	07/26/18 19:52	
Bromodichloromethane	ug/L	ND	1.0	07/26/18 19:52	
Bromoform	ug/L	ND	1.0	07/26/18 19:52	
Bromomethane	ug/L	ND	2.0	07/26/18 19:52	
Carbon disulfide	ug/L	ND	2.0	07/26/18 19:52	
Carbon tetrachloride	ug/L	ND	1.0	07/26/18 19:52	
Chlorobenzene	ug/L	ND	1.0	07/26/18 19:52	
Chloroethane	ug/L	ND	1.0	07/26/18 19:52	
Chloroform	ug/L	ND	1.0	07/26/18 19:52	
Chloromethane	ug/L	ND	1.0	07/26/18 19:52	
cis-1,2-Dichloroethene	ug/L	ND	1.0	07/26/18 19:52	
cis-1,3-Dichloropropene	ug/L	ND	1.0	07/26/18 19:52	
Dibromochloromethane	ug/L	ND	1.0	07/26/18 19:52	
Dibromomethane	ug/L	ND	1.0	07/26/18 19:52	
Ethylbenzene	ug/L	ND	1.0	07/26/18 19:52	
Iodomethane	ug/L	ND	5.0	07/26/18 19:52	
Methylene Chloride	ug/L	ND	1.0	07/26/18 19:52	
Styrene	ug/L	ND	1.0	07/26/18 19:52	
Tetrachloroethene	ug/L	ND	1.0	07/26/18 19:52	
Toluene	ug/L	ND	1.0	07/26/18 19:52	
trans-1,2-Dichloroethene	ug/L	ND	1.0	07/26/18 19:52	
trans-1,3-Dichloropropene	ug/L	ND	1.0	07/26/18 19:52	
trans-1,4-Dichloro-2-butene	ug/L	ND	1.0	07/26/18 19:52	
Trichloroethene	ug/L	ND	1.0	07/26/18 19:52	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

METHOD BLANK: 2333717 Matrix: Water
Associated Lab Samples: 92392127021, 92392127022, 92392127023

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Trichlorofluoromethane	ug/L	ND	1.0	07/26/18 19:52	
Vinyl acetate	ug/L	ND	2.0	07/26/18 19:52	
Vinyl chloride	ug/L	ND	1.0	07/26/18 19:52	
Xylene (Total)	ug/L	ND	1.0	07/26/18 19:52	
1,2-Dichloroethane-d4 (S)	%	102	70-130	07/26/18 19:52	
4-Bromofluorobenzene (S)	%	100	70-130	07/26/18 19:52	
Toluene-d8 (S)	%	102	70-130	07/26/18 19:52	

LABORATORY CONTROL SAMPLE: 2333718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	49.8	100	80-125	
1,1,1-Trichloroethane	ug/L	50	51.1	102	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	49.7	99	79-124	
1,1,2-Trichloroethane	ug/L	50	48.9	98	85-125	
1,1-Dichloroethane	ug/L	50	48.5	97	73-126	
1,1-Dichloroethene	ug/L	50	54.7	109	66-135	
1,2,3-Trichloropropane	ug/L	50	47.8	96	75-130	
1,2-Dichlorobenzene	ug/L	50	47.9	96	80-133	
1,2-Dichloroethane	ug/L	50	48.3	97	67-128	
1,2-Dichloropropane	ug/L	50	49.1	98	75-132	
1,4-Dichlorobenzene	ug/L	50	48.5	97	78-130	
2-Butanone (MEK)	ug/L	100	95.8	96	61-144	
2-Hexanone	ug/L	100	98.9	99	68-143	
4-Methyl-2-pentanone (MIBK)	ug/L	100	97.6	98	72-135	
Acetone	ug/L	100	95.0	95	48-146	
Acrylonitrile	ug/L	250	251	100	40-160	
Benzene	ug/L	50	50.3	101	80-125	
Bromochloromethane	ug/L	50	50.3	101	71-125	
Bromodichloromethane	ug/L	50	52.7	105	78-124	
Bromoform	ug/L	50	52.2	104	71-128	
Bromomethane	ug/L	50	43.5	87	40-160	
Carbon disulfide	ug/L	50	50.2	100	50-160	
Carbon tetrachloride	ug/L	50	52.0	104	69-131	
Chlorobenzene	ug/L	50	48.1	96	81-122	
Chloroethane	ug/L	50	41.1	82	39-148	
Chloroform	ug/L	50	52.1	104	73-127	
Chloromethane	ug/L	50	44.4	89	44-146	
cis-1,2-Dichloroethene	ug/L	50	50.1	100	74-124	
cis-1,3-Dichloropropene	ug/L	50	51.5	103	72-132	
Dibromochloromethane	ug/L	50	52.6	105	78-125	
Dibromomethane	ug/L	50	48.3	97	82-120	
Ethylbenzene	ug/L	50	49.2	98	79-121	
Iodomethane	ug/L	100	56.6	57	39-154	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

LABORATORY CONTROL SAMPLE: 2333718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Methylene Chloride	ug/L	50	44.7	89	64-133	
Styrene	ug/L	50	48.0	96	84-126	
Tetrachloroethene	ug/L	50	46.6	93	78-122	
Toluene	ug/L	50	48.7	97	80-121	
trans-1,2-Dichloroethene	ug/L	50	50.6	101	71-127	
trans-1,3-Dichloropropene	ug/L	50	51.0	102	69-141	
trans-1,4-Dichloro-2-butene	ug/L	50	54.3	109	40-160	
Trichloroethene	ug/L	50	49.5	99	78-122	
Trichlorofluoromethane	ug/L	50	50.9	102	53-137	
Vinyl acetate	ug/L	100	118	118	40-160	
Vinyl chloride	ug/L	50	51.2	102	58-137	
Xylene (Total)	ug/L	150	146	98	81-126	
1,2-Dichloroethane-d4 (S)	%			102	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE SAMPLE: 2333720

Parameter	Units	92391915009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	40	43.5	109	70-130	
1,1,1-Trichloroethane	ug/L	ND	40	44.6	112	70-130	
1,1,2,2-Tetrachloroethane	ug/L	ND	40	42.2	105	70-130	
1,1,2-Trichloroethane	ug/L	ND	40	41.8	104	70-130	
1,1-Dichloroethane	ug/L	ND	40	42.5	106	70-130	
1,1-Dichloroethene	ug/L	ND	40	49.0	123	70-166	
1,2,3-Trichloropropane	ug/L	ND	40	40.5	101	70-130	
1,2-Dichlorobenzene	ug/L	ND	40	41.3	103	70-130	
1,2-Dichloroethane	ug/L	ND	40	41.0	103	70-130	
1,2-Dichloropropane	ug/L	ND	40	42.9	107	70-130	
1,4-Dichlorobenzene	ug/L	ND	40	41.1	103	70-130	
2-Butanone (MEK)	ug/L	ND	80	86.5	108	70-130	
2-Hexanone	ug/L	ND	80	85.6	107	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	80	82.7	103	70-130	
Acetone	ug/L	ND	80	82.3	103	70-130	
Acrylonitrile	ug/L	ND	200	215	107	70-130	
Benzene	ug/L	ND	40	43.8	110	70-148	
Bromochloromethane	ug/L	ND	40	43.4	108	70-130	
Bromodichloromethane	ug/L	ND	40	44.6	111	70-130	
Bromoform	ug/L	ND	40	43.1	108	70-130	
Bromomethane	ug/L	ND	40	33.3	83	70-130	
Carbon disulfide	ug/L	ND	40	45.1	113	70-130	
Carbon tetrachloride	ug/L	ND	40	46.0	115	70-130	
Chlorobenzene	ug/L	ND	40	42.0	105	70-146	
Chloroethane	ug/L	ND	40	37.3	93	70-130	
Chloroform	ug/L	ND	40	45.6	114	70-130	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

MATRIX SPIKE SAMPLE: 2333720

Parameter	Units	92391915009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloromethane	ug/L	ND	40	38.8	97	70-130	
cis-1,2-Dichloroethene	ug/L	ND	40	44.0	110	70-130	
cis-1,3-Dichloropropene	ug/L	ND	40	43.6	109	70-130	
Dibromochloromethane	ug/L	ND	40	43.6	109	70-130	
Dibromomethane	ug/L	ND	40	41.7	104	70-130	
Ethylbenzene	ug/L	ND	40	43.0	107	70-130	
Iodomethane	ug/L	ND	80	41.6	52	70-130	M1
Methylene Chloride	ug/L	ND	40	36.7	92	70-130	
Styrene	ug/L	ND	40	41.8	104	70-130	
Tetrachloroethene	ug/L	ND	40	41.1	103	70-130	
Toluene	ug/L	1.7	40	43.8	105	70-155	
trans-1,2-Dichloroethene	ug/L	ND	40	45.4	113	70-130	
trans-1,3-Dichloropropene	ug/L	ND	40	43.6	109	70-130	
trans-1,4-Dichloro-2-butene	ug/L	ND	40	41.7	104	70-130	
Trichloroethene	ug/L	ND	40	43.5	109	69-151	
Trichlorofluoromethane	ug/L	ND	40	46.5	116	70-130	
Vinyl acetate	ug/L	ND	80	93.1	116	70-130	
Vinyl chloride	ug/L	ND	40	45.8	115	70-130	
Xylene (Total)	ug/L	ND	120	127	105	70-130	
1,2-Dichloroethane-d4 (S)	%				102	70-130	
4-Bromofluorobenzene (S)	%				100	70-130	
Toluene-d8 (S)	%				97	70-130	

SAMPLE DUPLICATE: 2333719

Parameter	Units	92391915008 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	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

SAMPLE DUPLICATE: 2333719

Parameter	Units	92391915008 Result	Dup Result	RPD	Max RPD	Qualifiers
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	103	1		
4-Bromofluorobenzene (S)	%	100	101	1		
Toluene-d8 (S)	%	100	101	1		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 419648 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 2325693 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/17/18 22:43	

LABORATORY CONTROL SAMPLE: 2325694

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	268	107	90-110	

SAMPLE DUPLICATE: 2325695

Parameter	Units	92392072001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2600	2020	25	5	D6

SAMPLE DUPLICATE: 2325696

Parameter	Units	92392158005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	178	187	5	5	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 419898 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

METHOD BLANK: 2326934 Matrix: Water
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/19/18 00:29	

LABORATORY CONTROL SAMPLE: 2326935

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	238	95	90-110	

SAMPLE DUPLICATE: 2326936

Parameter	Units	92392394001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	174	183	5	5	

SAMPLE DUPLICATE: 2326937

Parameter	Units	92392127010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	690	478	36	5	D6

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420158 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017

METHOD BLANK: 2328024 Matrix: Water
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/19/18 22:16	

LABORATORY CONTROL SAMPLE: 2328025

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	254	102	90-110	

SAMPLE DUPLICATE: 2328026

Parameter	Units	92392497005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	147	143	3	5	

SAMPLE DUPLICATE: 2328027

Parameter	Units	92392497015 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	154	161	4	5	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420491 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 2329557 Matrix: Water
Associated Lab Samples: 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	07/25/18 17:19	

LABORATORY CONTROL SAMPLE: 2329558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 2329559

Parameter	Units	92392491001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	214	219	2	5	

SAMPLE DUPLICATE: 2329560

Parameter	Units	92392127021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 419709 Analysis Method: EPA 300.0 Rev 2.1 1993
QC Batch Method: EPA 300.0 Rev 2.1 1993 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 2325875 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/18/18 21:16	
Fluoride	mg/L	ND	0.10	07/18/18 21:16	
Sulfate	mg/L	ND	1.0	07/18/18 21:16	

LABORATORY CONTROL SAMPLE: 2325876

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	53.7	107	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	50	48.3	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2325877 2325878

Parameter	Units	92392098005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	24.7	50	50	77.1	77.3	105	105	90-110	0	10	
Fluoride	mg/L	0.12	2.5	2.5	2.5	2.5	95	95	90-110	1	10	
Sulfate	mg/L	13.5	50	50	60.2	60.5	93	94	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2325879 2325880

Parameter	Units	92392098015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	9.8	50	50	62.8	62.9	106	106	90-110	0	10	
Fluoride	mg/L	0.069J	2.5	2.5	2.4	2.5	95	95	90-110	0	10	
Sulfate	mg/L	15.4	50	50	62.3	62.5	94	94	90-110	0	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420253 Analysis Method: EPA 300.0 Rev 2.1 1993
QC Batch Method: EPA 300.0 Rev 2.1 1993 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

METHOD BLANK: 2328338 Matrix: Water
Associated Lab Samples: 92392127007, 92392127008, 92392127009, 92392127010, 92392127011, 92392127012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/20/18 15:01	
Fluoride	mg/L	ND	0.10	07/20/18 15:01	
Sulfate	mg/L	ND	1.0	07/20/18 15:01	

LABORATORY CONTROL SAMPLE: 2328339

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	53.1	106	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	50	48.2	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2328340 2328341

Parameter	Units	92392347027 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	24.9	50	50	75.8	76.4	102	103	90-110	1	10	
Fluoride	mg/L	0.13	2.5	2.5	2.5	2.5	93	95	90-110	2	10	
Sulfate	mg/L	13.5	50	50	60.4	61.1	94	95	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2328342 2328343

Parameter	Units	92392347037 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.4	50	50	57.1	58.4	103	106	90-110	2	10	
Fluoride	mg/L	0.050U	2.5	2.5	2.4	2.6	96	100	90-110	4	10	
Sulfate	mg/L	8.3	50	50	55.3	57.1	94	98	90-110	3	10	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 420454 Analysis Method: EPA 300.0 Rev 2.1 1993
QC Batch Method: EPA 300.0 Rev 2.1 1993 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 2329418 Matrix: Water
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/24/18 14:55	
Fluoride	mg/L	ND	0.10	07/24/18 14:55	
Sulfate	mg/L	ND	1.0	07/24/18 14:55	

LABORATORY CONTROL SAMPLE: 2329419

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.8	104	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	50	46.8	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2329420 2329421

Parameter	Units	92392127014 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	20.5	50	50	72.0	73.8	103	107	90-110	2	10	
Fluoride	mg/L	0.47	2.5	2.5	2.8	2.9	94	98	90-110	3	10	
Sulfate	mg/L	4.1	50	50	51.0	52.8	94	97	90-110	4	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2329422 2329423

Parameter	Units	92392601004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	72.5	50	50	113	102	81	59	90-110	10	10	M1
Fluoride	mg/L	0.42	2.5	2.5	2.7	2.8	92	94	90-110	2	10	
Sulfate	mg/L	54.4	50	50	91.4	82.7	74	57	90-110	10	10	M1

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: SW-1 **Lab ID: 92392127001** Collected: 07/16/18 10:37 Received: 07/17/18 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**3.12 ± 1.45 (0.445) C:NA T:86%**	pCi/L	08/01/18 11:19	13982-63-3	
Radium-228	EPA 904.0	**1.43 ± 0.823 (1.52) C:65% T:61%**	pCi/L	08/02/18 11:58	15262-20-1	
Total Radium	Total Radium Calculation	**4.55 ± 2.27 (1.97)**	pCi/L	08/07/18 13:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: BG-1 **Lab ID: 92392127002** Collected: 07/16/18 15:40 Received: 07/17/18 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.177 ± 0.348 (0.635) C:NA T:94%**	pCi/L	08/01/18 11:19	13982-63-3	
Radium-228	EPA 904.0	**0.282 ± 0.424 (0.916) C:67% T:83%**	pCi/L	08/02/18 11:58	15262-20-1	
Total Radium	Total Radium Calculation	**0.459 ± 0.772 (1.55)**	pCi/L	08/07/18 13:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: LEACHATE **Lab ID: 92392127003** Collected: 07/16/18 17:20 Received: 07/17/18 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.585 ± 0.501 (0.679) C:NA T:85%**	pCi/L	08/01/18 11:19	13982-63-3	
Radium-228	EPA 904.0	**0.260 ± 0.449 (0.979) C:67% T:77%**	pCi/L	08/02/18 11:58	15262-20-1	
Total Radium	Total Radium Calculation	**0.845 ± 0.950 (1.66)**	pCi/L	08/07/18 13:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127004** Collected: 07/16/18 16:30 Received: 07/17/18 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.211 ± 0.365 (0.652) C:NA T:79%**	pCi/L	08/01/18 11:19	13982-63-3	
Radium-228	EPA 904.0	**0.898 ± 0.577 (1.12) C:66% T:85%**	pCi/L	08/02/18 11:58	15262-20-1	
Total Radium	Total Radium Calculation	**1.11 ± 0.942 (1.77)**	pCi/L	08/07/18 13:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127005** Collected: 07/16/18 19:00 Received: 07/17/18 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0604 ± 0.355 (0.725) C:NA T:92%**	pCi/L	08/01/18 11:19	13982-63-3	
Radium-228	EPA 904.0	**0.123 ± 0.464 (1.05) C:65% T:77%**	pCi/L	08/02/18 11:58	15262-20-1	
Total Radium	Total Radium Calculation	**0.183 ± 0.819 (1.78)**	pCi/L	08/07/18 14:14	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-4 **Lab ID: 92392127007** Collected: 07/17/18 09:30 Received: 07/18/18 07:11 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.459 ± 0.638 (1.08) C:NA T:88%**	pCi/L	08/01/18 20:22	13982-63-3	
Radium-228	EPA 904.0	**0.109 ± 0.477 (1.08) C:73% T:89%**	pCi/L	08/06/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.568 ± 1.12 (2.16)**	pCi/L	08/07/18 14:05	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-6 **Lab ID: 92392127008** Collected: 07/17/18 12:05 Received: 07/18/18 07:11 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.382 ± 0.541 (0.917) C:NA T:85%**	pCi/L	08/01/18 20:22	13982-63-3	
Radium-228	EPA 904.0	**1.02 ± 0.444 (0.798) C:66% T:79%**	pCi/L	08/02/18 13:05	15262-20-1	
Total Radium	Total Radium Calculation	**1.40 ± 0.985 (1.72)**	pCi/L	08/06/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-3 **Lab ID: 92392127009** Collected: 07/17/18 17:20 Received: 07/18/18 07:11 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.09 ± 0.766 (1.01) C:NA T:75%**	pCi/L	08/01/18 20:41	13982-63-3	
Radium-228	EPA 904.0	**1.70 ± 0.460 (0.694) C:67% T:86%**	pCi/L	08/02/18 13:05	15262-20-1	
Total Radium	Total Radium Calculation	**2.79 ± 1.23 (1.70)**	pCi/L	08/06/18 12:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-6 DUPE **Lab ID: 92392127010** Collected: 07/17/18 12:05 Received: 07/18/18 07:11 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 ± 0.400 (0.698) C:NA T:99%**	pCi/L	08/07/18 10:20	13982-63-3	
Radium-228	EPA 904.0	**0.281 ± 0.428 (0.925) C:74% T:75%**	pCi/L	08/06/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.487 ± 0.828 (1.62)**	pCi/L	08/07/18 14:05	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127011** Collected: 07/17/18 17:00 Received: 07/18/18 07:11 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0282 ± 0.399 (0.814) C:NA T:89%**	pCi/L	08/07/18 10:20	13982-63-3	
Radium-228	EPA 904.0	**-0.286 ± 0.385 (0.957) C:70% T:78%**	pCi/L	08/06/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.0282 ± 0.784 (1.77)**	pCi/L	08/07/18 14:05	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127012** Collected: 07/17/18 20:20 Received: 07/18/18 07:11 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0692 ± 0.511 (0.976) C:NA T:89%**	pCi/L	08/07/18 10:20	13982-63-3	
Radium-228	EPA 904.0	**0.850 ± 0.438 (0.766) C:72% T:84%**	pCi/L	08/06/18 11:57	15262-20-1	
Total Radium	Total Radium Calculation	**0.919 ± 0.949 (1.74)**	pCi/L	08/07/18 14:05	7440-14-4	

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-5 **Lab ID: 92392127014** Collected: 07/18/18 10:10 Received: 07/19/18 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0642 ± 0.377 (0.771) C:NA T:93%**	pCi/L	08/08/18 12:05	13982-63-3	
Radium-228	EPA 904.0	**0.137 ± 0.457 (1.03) C:62% T:75%**	pCi/L	08/08/18 13:15	15262-20-1	
Total Radium	Total Radium Calculation	**0.201 ± 0.834 (1.80)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-7R **Lab ID: 92392127015** Collected: 07/18/18 15:00 Received: 07/19/18 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0741 ± 0.385 (0.798) C:NA T:76%**	pCi/L	08/08/18 12:05	13982-63-3	
Radium-228	EPA 904.0	**-0.454 ± 0.697 (1.65) C:59% T:77%**	pCi/L	08/08/18 16:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.0741 ± 1.08 (2.45)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127016** Collected: 07/18/18 11:10 Received: 07/19/18 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.062 ± 0.283 (0.668) C:NA T:88%**	pCi/L	08/08/18 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.906 ± 0.658 (1.30) C:57% T:83%**	pCi/L	08/08/18 16:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.906 ± 0.941 (1.97)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127017** Collected: 07/18/18 12:00 Received: 07/19/18 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.247 ± 0.297 (0.454) C:NA T:97%**	pCi/L	08/08/18 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.496 ± 0.578 (1.22) C:64% T:74%**	pCi/L	08/08/18 16:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.743 ± 0.875 (1.67)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-8 **Lab ID: 92392127019** Collected: 07/19/18 10:40 Received: 07/20/18 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.06 ± 0.604 (0.555) C:NA T:76%**	pCi/L	08/08/18 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.568 ± 0.610 (1.28) C:66% T:80%**	pCi/L	08/08/18 16:28	15262-20-1	
Total Radium	Total Radium Calculation	**1.63 ± 1.21 (1.84)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: MW-1 **Lab ID: 92392127020** Collected: 07/19/18 15:10 Received: 07/20/18 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.187 ± 0.285 (0.747) C:NA T:93%**	pCi/L	08/08/18 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.300 ± 0.527 (1.15) C:61% T:87%**	pCi/L	08/08/18 16:28	15262-20-1	
Total Radium	Total Radium Calculation	**0.300 ± 0.812 (1.90)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: AMB **Lab ID: 92392127021** Collected: 07/19/18 13:20 Received: 07/20/18 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.130 ± 0.443 (0.855) C:NA T:88%**	pCi/L	08/08/18 12:35	13982-63-3	
Radium-228	EPA 904.0	**1.33 ± 0.744 (1.37) C:60% T:69%**	pCi/L	08/08/18 16:28	15262-20-1	
Total Radium	Total Radium Calculation	**1.46 ± 1.19 (2.23)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Sample: EQ BLANK **Lab ID: 92392127022** Collected: 07/19/18 18:30 Received: 07/20/18 08:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.614 ± 0.486 (0.661) C:NA T:92%**	pCi/L	08/08/18 12:35	13982-63-3	
Radium-228	EPA 904.0	**0.407 ± 0.583 (1.25) C:56% T:71%**	pCi/L	08/08/18 16:22	15262-20-1	
Total Radium	Total Radium Calculation	**1.02 ± 1.07 (1.91)**	pCi/L	08/13/18 15:46	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 306848 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92392127008, 92392127009

METHOD BLANK: 1500272 Matrix: Water
Associated Lab Samples: 92392127008, 92392127009

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.375 ± 0.328 (0.651) C:70% T:81%	pCi/L	08/02/18 13:06	

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 308122 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92392127010, 92392127011, 92392127012

METHOD BLANK: 1506084 Matrix: Water
Associated Lab Samples: 92392127010, 92392127011, 92392127012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.069 ± 0.427 (0.911) C:NA T:81%	pCi/L	08/07/18 10:00	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 306843 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 1500265 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.335 (0.540) C:NA T:80%	pCi/L	08/01/18 10:48	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 306847 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92392127007, 92392127008, 92392127009

METHOD BLANK: 1500271 Matrix: Water
Associated Lab Samples: 92392127007, 92392127008, 92392127009

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0787 ± 0.359 (0.579) C:NA T:86%	pCi/L	08/01/18 20:22	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 308027 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 1505667 Matrix: Water
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.345 ± 0.361 (0.747) C:71% T:84%	pCi/L	08/08/18 13:17	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 306844 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

METHOD BLANK: 1500268 Matrix: Water
Associated Lab Samples: 92392127001, 92392127002, 92392127003, 92392127004, 92392127005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.688 ± 0.421 (0.782) C:73% T:79%	pCi/L	08/02/18 11:57	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 308017 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

METHOD BLANK: 1505641 Matrix: Water
Associated Lab Samples: 92392127014, 92392127015, 92392127016, 92392127017, 92392127019, 92392127020, 92392127021, 92392127022

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.374 (0.809) C:NA T:85%	pCi/L	08/08/18 12:05	

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

QC Batch: 308025 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92392127007, 92392127010, 92392127011, 92392127012

METHOD BLANK: 1505666 Matrix: Water
Associated Lab Samples: 92392127007, 92392127010, 92392127011, 92392127012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.602 ± 0.400 (0.763) C:74% T:86%	pCi/L	08/06/18 11:56	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

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.

TNTC - Too Numerous To Count

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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.

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

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
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.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92392127001	**SW-1**	EPA 3010A	419650	EPA 6010D	419669
92392127002	**BG-1**	EPA 3010A	419650	EPA 6010D	419669
92392127003	**LEACHATE**	EPA 3010A	419650	EPA 6010D	419669
92392127004	**AMB**	EPA 3010A	419650	EPA 6010D	419669
92392127005	**EQ BLANK**	EPA 3010A	419650	EPA 6010D	419669
92392127007	**MW-4**	EPA 3010A	419903	EPA 6010D	419925
92392127008	**MW-6**	EPA 3010A	419903	EPA 6010D	419925
92392127009	**MW-3**	EPA 3010A	419903	EPA 6010D	419925
92392127010	**MW-6 DUPE**	EPA 3010A	419903	EPA 6010D	419925
92392127011	**AMB**	EPA 3010A	419903	EPA 6010D	419925
92392127012	**EQ BLANK**	EPA 3010A	419903	EPA 6010D	419925
92392127014	**MW-5**	EPA 3010A	420174	EPA 6010D	420183
92392127015	**MW-7R**	EPA 3010A	420174	EPA 6010D	420183
92392127016	**AMB**	EPA 3010A	420174	EPA 6010D	420183
92392127017	**EQ BLANK**	EPA 3010A	420174	EPA 6010D	420183
92392127019	**MW-8**	EPA 3010A	420420	EPA 6010D	420433
92392127020	**MW-1**	EPA 3010A	420420	EPA 6010D	420433
92392127021	**AMB**	EPA 3010A	420420	EPA 6010D	420433
92392127022	**EQ BLANK**	EPA 3010A	420420	EPA 6010D	420433
92392127001	**SW-1**	EPA 3020	551351	EPA 6020B	551681
92392127002	**BG-1**	EPA 3020	551351	EPA 6020B	551681
92392127003	**LEACHATE**	EPA 3020	551351	EPA 6020B	551681
92392127004	**AMB**	EPA 3020	551351	EPA 6020B	551681
92392127005	**EQ BLANK**	EPA 3020	551351	EPA 6020B	551681
92392127007	**MW-4**	EPA 3020	551856	EPA 6020B	552211
92392127008	**MW-6**	EPA 3020	551856	EPA 6020B	552211
92392127009	**MW-3**	EPA 3020	551856	EPA 6020B	552211
92392127010	**MW-6 DUPE**	EPA 3020	551856	EPA 6020B	552211
92392127011	**AMB**	EPA 3020	551856	EPA 6020B	552211
92392127012	**EQ BLANK**	EPA 3020	551856	EPA 6020B	552211
92392127014	**MW-5**	EPA 3020	551856	EPA 6020B	552211
92392127015	**MW-7R**	EPA 3020	551856	EPA 6020B	552211
92392127016	**AMB**	EPA 3020	551856	EPA 6020B	552211
92392127017	**EQ BLANK**	EPA 3020	551856	EPA 6020B	552211
92392127019	**MW-8**	EPA 3020	551856	EPA 6020B	552211
92392127020	**MW-1**	EPA 3020	551856	EPA 6020B	552211
92392127021	**AMB**	EPA 3020	551856	EPA 6020B	552211
92392127022	**EQ BLANK**	EPA 3020	551856	EPA 6020B	552211
92392127001	**SW-1**	EPA 7470A	419757	EPA 7470A	419777
92392127002	**BG-1**	EPA 7470A	419757	EPA 7470A	419777
92392127003	**LEACHATE**	EPA 7470A	419757	EPA 7470A	419777
92392127004	**AMB**	EPA 7470A	419757	EPA 7470A	419777
92392127005	**EQ BLANK**	EPA 7470A	419757	EPA 7470A	419777
92392127007	**MW-4**	EPA 7470A	420010	EPA 7470A	420019
92392127008	**MW-6**	EPA 7470A	420010	EPA 7470A	420019

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92392127009	MW-3	EPA 7470A	420010	EPA 7470A	420019
92392127010	MW-6 DUPE	EPA 7470A	420010	EPA 7470A	420019
92392127011	AMB	EPA 7470A	420010	EPA 7470A	420019
92392127012	EQ BLANK	EPA 7470A	420010	EPA 7470A	420019
92392127014	MW-5	EPA 7470A	420288	EPA 7470A	420375
92392127015	MW-7R	EPA 7470A	420574	EPA 7470A	420627
92392127016	AMB	EPA 7470A	420574	EPA 7470A	420627
92392127017	EQ BLANK	EPA 7470A	420288	EPA 7470A	420375
92392127019	MW-8	EPA 7470A	420486	EPA 7470A	420493
92392127020	MW-1	EPA 7470A	420486	EPA 7470A	420493
92392127021	AMB	EPA 7470A	420486	EPA 7470A	420493
92392127022	EQ BLANK	EPA 7470A	420486	EPA 7470A	420493
92392127001	SW-1	EPA 8260B	420460		
92392127002	BG-1	EPA 8260B	420460		
92392127003	LEACHATE	EPA 8260B	420460		
92392127004	AMB	EPA 8260B	420460		
92392127005	EQ BLANK	EPA 8260B	420460		
92392127006	TRIP BLANK	EPA 8260B	420460		
92392127007	MW-4	EPA 8260B	420460		
92392127008	MW-6	EPA 8260B	420460		
92392127009	MW-3	EPA 8260B	420460		
92392127010	MW-6 DUPE	EPA 8260B	420460		
92392127011	AMB	EPA 8260B	420460		
92392127012	EQ BLANK	EPA 8260B	420460		
92392127013	TRIP BLANK	EPA 8260B	420460		
92392127014	MW-5	EPA 8260B	420460		
92392127015	MW-7R	EPA 8260B	420460		
92392127016	AMB	EPA 8260B	420460		
92392127017	EQ BLANK	EPA 8260B	420460		
92392127018	TRIP BLANK	EPA 8260B	420460		
92392127019	MW-8	EPA 8260B	420460		
92392127020	MW-1	EPA 8260B	420460		
92392127021	AMB	EPA 8260B	421362		
92392127022	EQ BLANK	EPA 8260B	421362		
92392127023	TRIP BLANK	EPA 8260B	421362		
92392127001	SW-1	EPA 903.1	306843		
92392127002	BG-1	EPA 903.1	306843		
92392127003	LEACHATE	EPA 903.1	306843		
92392127004	AMB	EPA 903.1	306843		
92392127005	EQ BLANK	EPA 903.1	306843		
92392127007	MW-4	EPA 903.1	306847		
92392127008	MW-6	EPA 903.1	306847		
92392127009	MW-3	EPA 903.1	306847		
92392127010	MW-6 DUPE	EPA 903.1	308122		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92392127011	AMB	EPA 903.1	308122		
92392127012	EQ BLANK	EPA 903.1	308122		
92392127014	MW-5	EPA 903.1	308017		
92392127015	MW-7R	EPA 903.1	308017		
92392127016	AMB	EPA 903.1	308017		
92392127017	EQ BLANK	EPA 903.1	308017		
92392127019	MW-8	EPA 903.1	308017		
92392127020	MW-1	EPA 903.1	308017		
92392127021	AMB	EPA 903.1	308017		
92392127022	EQ BLANK	EPA 903.1	308017		
92392127001	SW-1	EPA 904.0	306844		
92392127002	BG-1	EPA 904.0	306844		
92392127003	LEACHATE	EPA 904.0	306844		
92392127004	AMB	EPA 904.0	306844		
92392127005	EQ BLANK	EPA 904.0	306844		
92392127007	MW-4	EPA 904.0	308025		
92392127008	MW-6	EPA 904.0	306848		
92392127009	MW-3	EPA 904.0	306848		
92392127010	MW-6 DUPE	EPA 904.0	308025		
92392127011	AMB	EPA 904.0	308025		
92392127012	EQ BLANK	EPA 904.0	308025		
92392127014	MW-5	EPA 904.0	308027		
92392127015	MW-7R	EPA 904.0	308027		
92392127016	AMB	EPA 904.0	308027		
92392127017	EQ BLANK	EPA 904.0	308027		
92392127019	MW-8	EPA 904.0	308027		
92392127020	MW-1	EPA 904.0	308027		
92392127021	AMB	EPA 904.0	308027		
92392127022	EQ BLANK	EPA 904.0	308027		
92392127001	SW-1	Total Radium Calculation	308681		
92392127002	BG-1	Total Radium Calculation	308681		
92392127003	LEACHATE	Total Radium Calculation	308681		
92392127004	AMB	Total Radium Calculation	308681		
92392127005	EQ BLANK	Total Radium Calculation	308693		
92392127007	MW-4	Total Radium Calculation	308690		
92392127008	MW-6	Total Radium Calculation	308499		
92392127009	MW-3	Total Radium Calculation	308499		
92392127010	MW-6 DUPE	Total Radium Calculation	308690		
92392127011	AMB	Total Radium Calculation	308690		
92392127012	EQ BLANK	Total Radium Calculation	308690		
92392127014	MW-5	Total Radium Calculation	309392		
92392127015	MW-7R	Total Radium Calculation	309392		
92392127016	AMB	Total Radium Calculation	309392		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CHARRAH-BRICKHAVEN
Pace Project No.: 92392127

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92392127017	EQ BLANK	Total Radium Calculation	309392		
92392127019	MW-8	Total Radium Calculation	309392		
92392127020	MW-1	Total Radium Calculation	309392		
92392127021	AMB	Total Radium Calculation	309392		
92392127022	EQ BLANK	Total Radium Calculation	309392		
92392127001	SW-1	SM 2540C-2011	419648		
92392127002	BG-1	SM 2540C-2011	419648		
92392127003	LEACHATE	SM 2540C-2011	419648		
92392127004	AMB	SM 2540C-2011	419648		
92392127005	EQ BLANK	SM 2540C-2011	419648		
92392127007	MW-4	SM 2540C-2011	419898		
92392127008	MW-6	SM 2540C-2011	419898		
92392127009	MW-3	SM 2540C-2011	419898		
92392127010	MW-6 DUPE	SM 2540C-2011	419898		
92392127011	AMB	SM 2540C-2011	419898		
92392127012	EQ BLANK	SM 2540C-2011	419898		
92392127014	MW-5	SM 2540C-2011	420158		
92392127015	MW-7R	SM 2540C-2011	420158		
92392127016	AMB	SM 2540C-2011	420158		
92392127017	EQ BLANK	SM 2540C-2011	420158		
92392127019	MW-8	SM 2540C-2011	420491		
92392127020	MW-1	SM 2540C-2011	420491		
92392127021	AMB	SM 2540C-2011	420491		
92392127022	EQ BLANK	SM 2540C-2011	420491		
92392127001	SW-1	EPA 300.0 Rev 2.1 1993	419709		
92392127002	BG-1	EPA 300.0 Rev 2.1 1993	419709		
92392127003	LEACHATE	EPA 300.0 Rev 2.1 1993	419709		
92392127004	AMB	EPA 300.0 Rev 2.1 1993	419709		
92392127005	EQ BLANK	EPA 300.0 Rev 2.1 1993	419709		
92392127007	MW-4	EPA 300.0 Rev 2.1 1993	420253		
92392127008	MW-6	EPA 300.0 Rev 2.1 1993	420253		
92392127009	MW-3	EPA 300.0 Rev 2.1 1993	420253		
92392127010	MW-6 DUPE	EPA 300.0 Rev 2.1 1993	420253		
92392127011	AMB	EPA 300.0 Rev 2.1 1993	420253		
92392127012	EQ BLANK	EPA 300.0 Rev 2.1 1993	420253		
92392127014	MW-5	EPA 300.0 Rev 2.1 1993	420454		
92392127015	MW-7R	EPA 300.0 Rev 2.1 1993	420454		
92392127016	AMB	EPA 300.0 Rev 2.1 1993	420454		
92392127017	EQ BLANK	EPA 300.0 Rev 2.1 1993	420454		
92392127019	MW-8	EPA 300.0 Rev 2.1 1993	420454		
92392127020	MW-1	EPA 300.0 Rev 2.1 1993	420454		
92392127021	AMB	EPA 300.0 Rev 2.1 1993	420454		
92392127022	EQ BLANK	EPA 300.0 Rev 2.1 1993	420454		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: HDR

Project # WO# : 92392127

92392127

Courier: ☐ Commercial ☑ Pace ☐ Fed Ex ☐ UPS ☐ USPS ☐ Other:____ ☐ Client

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: MD 7/17/18

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer: ☑ IR Gun ID: 92T040 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 1.6, 3.5 **Correction Factor:** Add/Subtract (°C) +0.4

Cooler Temp Corrected (°C): 5.0 3.9

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

TB not on COC.

Lot ID of split containers: _____

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project # **WO# : 92392127**

PM: KLH1 Due Date: 07/24/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1	1			2										3											
2		1	1			2										3											
3		1	1			2										3											
4																											
5		1	1			2										3											
6		1	1			2										3											
7																2-TB											
8																											
9																											
10																											
11																											
12																											

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

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	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO#: 92392127
PM: KLH1 Due Date: 07/24/18
CLIENT: 92-HDR

Courier: ☐ Commercial ☑ Pace ☐ Fed Ex ☐ UPS ☐ USPS ☐ Other:____ ☐ Client

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: MD 7/18/18

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A

Thermometer: ☐ IR Gun ID: 92T040 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 2.3, 1.5 **Correction Factor:** Add/Subtract (°C) +0.4

Cooler Temp Corrected (°C): 2.7, 1.9

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on Ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☐ Yes	☑ No	☐ N/A	9. Some Sample IDs wrong bt the times matched from COC. (AmD)
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11. TB not on COC
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project #

WO#: 92392127

PM: KLH1 Due Date: 07/24/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP1N	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1	1			2										3									3				
2		1	1			2										3									3				
3		1	1			2										3									3				
4		1	1			2										3									3				
5																													
6		1	1			2										3									3				
7		1	1			2										3									3				
8																2-TB													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

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	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

WO# : 92392127

Client Name: HDR Engineering

Project #:

PM: KLH1 Due Date: 07/24/18
CLIENT: 92-HDR

Courier: ☐ Commercial ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: CJK 7/19/18

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☑ No ☐ N/A

Thermometer: ☑ IR Gun ID: 92T040 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 1.7 **Correction Factor:** Add/Subtract (°C) +0.4

Cooler Temp Corrected (°C): 2.1

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on Ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

Field Data Required? ☐ Yes ☐ No

COMMENTS/SAMPLE DISCREPANCY

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project #

WO# : 92392127

PM: KLH1 Due Date: 07/24/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass Jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP1N	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1	1			2										3									3	3			
2		1	1			2										3									3	X			
3		1	1			2										3									3	X			
4		1	1			2										3									3	X			
5																2													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

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	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: HDR

Project #: WO#: 92392127
PM: KLH1 Due Date: 07/24/18
CLIENT: 92-HDR

Courier: ☐ Commercial ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: CDR 7/20/18

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☑ No ☐ N/A

Thermometer: ☑ IR Gun ID: 92T040 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 4.4 **Correction Factor:** Add/Subtract (°C) +0.4

Cooler Temp Corrected (°C): 4.8

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

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.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	9.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☑ Yes	☐ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☑ Yes	☐ No	☐ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project #

WO#: 92392127

PM: KLH1 Due Date: 07/24/18

CLIENT: 92-HDR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BPIN	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1	1			2										3									3			
2		1	1			2										3									3			
3		1	1			2										3									3			
4		1	1			2										3									3			
5																2												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

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

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A — Required Client Information:

Company:	HDR Engineering
Address:	440 South Church Street
	Charlotte, NC 28202
Email:	sean.quarry@hdrinc.com
Phone:	(704)248-3632 Fax:
Requested Due Date:	

Section B — Required Project Information:

Report To:	Sean Quarry
Copy To:	
Purchase Order #:	
Project Name:	Charrah-Brickhaven
Project #:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	kevin.herring@pacelabs.com,
Pace Profile #:	7672-1

Regulatory Agency:

State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260 Full List	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	92392127
1	SW-1	WT	G			7/16/18	1037	22.4	10	2			3	5*					3	1	1	3	1	1		001
2	BG-1	WT	G			7/16/18	1540	22.4	10	2			3	5*					3	1	1	3	1	1		002
3	LEACHATE	WT	G			7/16/18	1720	25.3	10	2			3	5*					3	1	1	3	1	1		003
4						7/16/18																				0
5	AMB	WT	G			7/16/18	1630		10	2			3	5*					3	1	1	3	1	1		004
6	EQ BLANK	WT	G			7/16/18	1900		10	2			3	5*					3	1	1	3	1	1		005
7																										006-TB
8																										
9																										
10																										
11																										
12																										

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Jesse Ahrl (PACE)	7/16/18	1920	[illegible]	7/17/18	7:30
	[signature]	7/16/18	2130	[signature]	7/17/18	10:30

SAMPLE CONDITIONS

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
S.O 2.9	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: JESSE AHRL

SIGNATURE of SAMPLER: [signature] DATE Signed: 7-16-18

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A
Required Client Information:

Company:	HDR Engineering
Address:	440 South Church Street
	Charlotte, NC 28202
Email:	sean.quarry@hdrinc.com
Phone:	(704)248-3632 Fax
Requested Due Date:	

Section B
Required Project Information:

Report To:	Sean Quarry
Copy To:	
Purchase Order #:	
Project Name:	Charrah-Brickhaven
Project #:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	kevin.herring@pacelabs.com,
Pace Profile #:	7672-1

Regulatory Agency

State / Location
NC

MATRIX CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS

SAMPLE ID
One Character per box.
(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 START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260 Full List	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	92392127
1	MW-4	WT	G			7/17/18	930	23.3	10	2		5	3							3	1	1	3	1	1		007
2	MW-6	WT	G			7/17/18	1205	30.6	10	2		5	3							3	1	1	3	1	1		008
3	MW-3	WT	G			7/17/18	1720	30.9	10	2		5	3							3	1	1	3	1	1		009
4	MW-6 DUPE	WT	G			7/17/18	1205	30.6	10	2		5	3							3	1	1	3	1	1		010
5																											
6	AMB	WT	G			7/17/18	1700		10	2		5	3						1	3	1	1	3	1	1		011
7	EQ BLANK	WT	G			7/17/18	2020		10	2		5	3							3	1	1	3	1	1		012
8																											13-TB
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] (PACE)	7/17/18	2045	[signature]	7/18/18	0711				
	[signature]	7/18/18	1325	Michael R	7/18/18	1325	2.7 1.9	Y	N	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Allred

SIGNATURE of SAMPLER: [signature]

DATE Signed: 7-17-18

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
Charlotte, NC 28202				Address:	
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone:	(704)248-3632 Fax	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.herring@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1

Regulatory Agency	
State / Location	NC

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260 Full List	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	92392127
1	MW 5	WT	G			7/16/18	1010	26.4	10	2		5	3						3	1	1	3	1	1			014
2	MW 7R	WT	G			7/16/18	1500	30.1	10	2		5	3						3	1	1	3	1	1			015
3																											
4	AMB	WT	G			7/16/18	1110		10	2		5	3						3	1	1	3	1	1			016
5	EQ BLANK	WT	G			7/16/18	1200		10	2		5	3						3	1	1	3	1	1			017
6																			1								018-TB
7																											
8																											
9																											
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jesse ALLRED (PACE)	7/18/18	1500		7/19/18	710				
		7-19-18	1200		7/19/18	1200	2.1	Y	N	Y

SAMPLER NAME AND SIGNATURE				
PRINT Name of SAMPLER:	Jesse ALLRED			
SIGNATURE of SAMPLER:		DATE Signed:	7/18/18	

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	HDR Engineering	Report To:	Sean Quarry	Attention:	
Address:	440 South Church Street	Copy To:		Company Name:	
	Charlotte, NC 28202			Address:	Regulatory Agency
Email:	sean.quarry@hdrinc.com	Purchase Order #:		Pace Quote:	
Phone:	(704)248-3632 Fax:	Project Name:	Charrah-Brickhaven	Pace Project Manager:	kevin.herring@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	7672-1
					State / Location: NC

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Trip BLANK	8260 Full List	300.0-Cl,F,Sulfate	TDS	Radium 226/228	6010/7470	6020 (B, Li)	Residual Chlorine (Y/N)	9239127
1	MW 8	WT	G			7/19/18	1040	24.2	10	2		5	3						3	1	1	3	1	1		019
2	MW 1	WT	G			7/19/18	1510	23.3	10	2		5	3						3	1	1	3	1	1		020
3																											
4	AMB	WT	G			7/19/18	1320		10	3		5	3						3	1	1	3	1	1		021
5	EQ BLANK	WT	G			7/19/18	1830		10	3		5	3						3	1	1	3	1	1		022
6																			2								023-TB
7																											
8																											
9																											
10																											
11																											
12																											

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jesse Allred (PACE)	7/20/18	0708		7/20/18	8:00	4.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jesse Allred

SIGNATURE of SAMPLER: Jesse Allred DATE Signed: 7-19-18

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

D

Appendix D – Electronic Data Deliverables (CD-ROM only)

This page intentionally left blank.

E

Appendix E – Statistical Analysis Memo

Memo

Date: Friday, September 28, 2018

To: Charah, LLC

From: HDR Engineering, Inc.

Subject: Summary of Statistical Analysis and Evaluation for SSIs
Charah, LLC BrickHaven No. Mine Tract 'A' Site
MSWFL Groundwater Monitoring Network

The Charah, LLC BrickHaven No. Mine Tract 'A' Site (BrickHaven Mine) is operating under the Facility Permit #1910-STRUC-2015 as a municipal solid waste land fill (MSWLF). As required by Section .1600 rules of the North Carolina Solid Waste Management Rules 15A NCAC 13B .1633, the owner or operator of a MSWLF facility shall accurately establish background groundwater quality for the detection monitoring program and determine if a statistically significant increase (SSI) over background has occurred in downgradient monitoring wells. This memorandum reports on the statistically-derived background threshold values (BTVs) for the Appendix I metals, Appendix I volatile organic compounds (VOCs), and Appendix III and Appendix IV constituents, and summarizes the results of testing for SSIs for the constituents collected during the detection monitoring rounds at designated in-network downgradient monitoring wells.

The statistical analysis was performed in accordance with the methods described in the Section .1600 rules of the North Carolina Solid Waste Management Rules for the BrickHaven Mine. Sampling results used to establish BTVs were obtained during twelve monitoring events performed between October 2015 and January 2018. Downgradient sampling results from two detection monitoring rounds in January 2018 and July 2018 were used to evaluate for SSIs. The calculated BTVs and the evaluation for SSIs over background for the Appendix I VOCs, Appendix I metals, and Appendix III and Appendix IV constituents are provided in **Table 1**, **Table 2**, **Table 3** and **Table 4**, respectively.

Table 1: Summary of Evaluation for SSIs over Background for Appendix I Metals (Detection Monitoring)

	Appendix I Metals				
	Copper**	**Nickel****	**Silver****	**Vanadium**	**Zinc**
Unit	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	*2.50*	*2.50*	*2.50*	5.50	10.0
Well	*First Detection Monitoring Round Results*				
MW-1	*2.50*	13.3	*2.50*	*2.50*	**16.1**
MW-2	6.60	33.8	*2.50*	*2.50*	*5.00*
MW-3	5.60	*2.50*	*2.50*	*2.50*	*5.00*
MW-4	*2.50*	6.90	*2.50*	*2.50*	*5.00*
MW-5	6.90	9.00	*2.50*	*2.50*	*5.00*
MW-6	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-7R	7.10	18.0	*2.50*	*2.50*	*5.00*
MW-8	10.2	13.8	*2.50*	*2.50*	*5.00*
Well	*Second Detection Monitoring Round Results*				

Appendix I Metals					
	Copper**	Nickel**	Silver**	Vanadium	Zinc
Unit	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	*2.50*	*2.50*	*2.50*	5.50	10.0
MW-1	*2.50*	**5.60**	*2.50*	*2.50*	*5.00*
MW-2*	--	--	--	--	--
MW-3	*2.50*	49.4	*2.50*	*2.50*	*5.00*
MW-4	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-5	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-6	*2.50*	*2.50*	*2.50*	*2.50*	*5.00*
MW-7R	*2.50*	**17.4**	*2.50*	*2.50*	*5.00*
MW-8	*2.50*	**10.8**	*2.50*	*2.50*	*5.00*

* Well was not sampled as it was dry.
** Constituents had all non-detects with the maximum method detection limit chosen as the BTV. The Double Quantification Rule is recommended for statistical evaluation.

Notes:
Italic concentration indicates a non-detect value
Underlined concentration indicates a detect value in the first DM round result for constituents with 100% background non-detects.
Bold and underlined concentration indicates an SSI over background.

Table 2: Summary of Evaluation for SSIs over Background for Appendix I VOCs (Detection Monitoring)

Appendix I VOCs**								
	1,4-Dichloro-benzene	Acet-one	Bromo-dichloro-methane	Bromo-form	Carbon disulfide	Chloro-form	Dibro-mochloro-methane	Dibromo-methane
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
Well	*First Detection Monitoring Round Results*							
MW-1	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-2	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-3	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-4	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-5	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-6	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-7R	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-8	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
Well	*Second Detection Monitoring Round Results*							
MW-1	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-2*	--	--	--	--	--	--	--	--
MW-3	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-4	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-5	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-6	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-7R	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*

Draft Charah Sensitive, Restricted and Pre-decisional

Appendix I VOCs**								
	1,4-Dichloro-benzene	Acet-one	Bromo-dichloro-methane	Bromo -form	Carbon disulfide	Chloro -form	Dibro-mochloro-methane	Dibromo-methane
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
BTV (UPL)	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*
MW-8	*0.330*	*10.0*	*0.180*	*0.260*	*1.20*	*0.140*	*0.210*	*0.210*

* Well was not sampled as it was dry.
** Constituents had all non-detects with the maximum method detection limit chosen as the BTV. The Double Quantification Rule is recommended for statistical evaluation.

Notes:
Italic concentration indicates a non-detect value
Underlined concentration indicates a detect value in the first DM round result for constituents with 100% background non-detects.
Bold and underlined concentration indicates an SSI over background.

Table 3: Summary of Evaluation for SSIs over Background for Appendix III Constituents (Detection Monitoring)

Appendix III Constituents							
	Boron	Calcium	Chloride	Fluoride	pH (Field)	Sulfate	TDS
Unit	ug/L	ug/L	mg/L	mg/L	S.U.	mg/L	mg/L
BTV (UPL)	14.1	37,173	322	0.155	6.01 - 7.11*	21.9	2,630
Well	*First Detection Monitoring Round Results*						
MW-1	6.20	**146,000**	**547**	0.120	6.70	6.60	1,020
MW-2	**40.7**	**182,000**	**1,180**	**0.280**	**7.60**	**73.3**	2,300
MW-3	**16.6**	**169,000**	**987**	**0.460**	**7.50**	**102**	1,060
MW-4	*1.50*	**66,700**	**492**	**0.320**	6.50	12.3	1,210
MW-5	11.2	15,100	19.7	**0.680**	**7.20**	5.30	246
MW-6	6.80	34,100	240	**0.520**	7.00	**126**	790
MW-7R	13.8	**89,700**	279	0.120	**7.70**	**22.6**	855
MW-8	10.1	**100,000**	**390**	*0.0500*	**7.20**	8.00	1,020
Well	*Second Detection Monitoring Round Results*						
MW-1	*2.90*	**131,000**	**531**	0.120	6.60	6.70	1,250
MW-2**	--	--	--	--	--	--	--
MW-3	*2.90*	**147,000**	**1,000**	**0.570**	7.10	**88.1**	2,170
MW-4	*2.90*	**65,700**	**518**	**0.300**	6.20	10.7	1,260
MW-5	12.2	10,100	20.5	**0.470**	7.00	4.10	233
MW-6	*2.90*	31,600	231	**0.420**	6.60	**69.7**	708
MW-7R	**16.8**	**74,000**	284	0.130	**7.60**	20.0	828
MW-8	10.6	**98,100**	**355**	*0.0500*	7.00	6.70	856

* Indicates the lower bound of the pH range is the LPL. The upper bound is the UPL.
** Well was not sampled as it was dry.

Notes:
Italic concentration indicates a non-detect value.
Bold and underlined concentration indicates an SSI over background.

Draft Charah Sensitive, Restricted and Pre-decisional

Table 4: Summary of Evaluation for SSIs over Background for Appendix IV Constituents (Detection Monitoring)

	Appendix IV Constituents																
	Anti-mony**	Ars-enic**	Bar-ium	Beryll-ium**	Cad-mium**	Chrom-ium**	Cob-alt**	Fluor-ide	Lead**	Lith-ium	Mer-cury**	Molyb-denum	Radium -226	Radium -228	Selen -ium**	Thall-ium	Total Rad-ium
Unit	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/L	ug/L	ug/L	ug/L	ug/L	pCi/L	pCi/L	ug/L	ug/L	pCi/L
BTV (UPL)	*3.90*	*5.00*	434	*0.500*	*0.500*	*2.50*	*2.50*	0.155	*2.50*	38.6	*0.100*	6.80	1.12	2.90	*5.00*	13.7	2.94
Well	*First Detection Monitoring Round Results*																
MW-1	*3.90*	*5.00*	175	*0.500*	*0.500*	18.4	*2.50*	0.120	*2.50*	33.3	*0.100*	*2.50*	0.225	0.537	*5.00*	*0.0300*	0.762
MW-2	6.90	*5.00*	314	*0.500*	*0.500*	56.8	*2.50*	**0.280**	*2.50*	**96.6**	*0.100*	**7.10**	0.648	0.716	*5.00*	*0.0300*	1.36
MW-3	5.80	*5.00*	**570**	*0.500*	*0.500*	5.30	*2.50*	**0.460**	*2.50*	**90.2**	*0.100*	**6.90**	**1.21**	1.08	*5.00*	*0.0300*	2.29
MW-4	*3.90*	*5.00*	300	*0.500*	*0.500*	5.70	*2.50*	**0.320**	*2.50*	28.6	*0.100*	*2.50*	0.00	0.710	*5.00*	*0.0300*	0.710
MW-5	*3.90*	*5.00*	123	*0.500*	*0.500*	15.3	*2.50*	**0.680**	*2.50*	7.10	*0.100*	*2.50*	0.153	-0.0690	*5.00*	*0.0300*	0.153
MW-6	*3.90*	*5.00*	106	*0.500*	*0.500*	*2.50*	*2.50*	**0.520**	*2.50*	**53.7**	0.320	*2.50*	0.0517	1.07	*5.00*	*0.0300*	1.12
MW-7R	*3.90*	*5.00*	251	*0.500*	*0.500*	33.0	*2.50*	0.120	*2.50*	24.7	*0.100*	*2.50*	0.0579	0.393	*5.00*	*0.0300*	0.451
MW-8	*3.90*	*5.00*	**1,210**	*0.500*	*0.500*	25.3	*2.50*	*0.0500*	*2.50*	25.3	0.370	*2.50*	0.298	0.427	*5.00*	*0.0300*	0.725
Well	*Second Detection Monitoring Round Results*																
MW-1	*3.90*	*5.00*	155	*0.500*	*0.500*	**6.80**	*2.50*	0.120	*2.50*	31.4	*0.100*	*2.50*	-0.187	0.300	*5.00*	*0.0300*	0.300
MW-2*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3	*3.90*	*5.00*	**510**	*0.500*	*0.500*	**81.4**	*2.50*	**0.570**	*2.50*	36.7	*0.100*	**7.80**	1.09	1.70	*5.00*	*0.0300*	2.79
MW-4	*3.90*	*5.00*	306	*0.500*	*0.500*	*2.50*	5.70	**0.300**	*2.50*	26.7	*0.100*	*2.50*	0.459	0.109	*5.00*	*0.0300*	0.568
MW-5	*3.90*	*5.00*	101	*0.500*	*0.500*	**5.10**	*2.50*	**0.470**	*2.50*	8.90	*0.100*	*2.50*	0.0642	0.137	*5.00*	*0.0300*	0.201
MW-6	*3.90*	*5.00*	104	*0.500*	*0.500*	*2.50*	*2.50*	**0.420**	*2.50*	**40.0**	*0.100*	*2.50*	0.382	1.02	*5.00*	*0.0300*	1.40
MW-7R	*3.90*	*5.00*	193	*0.500*	*0.500*	**33.7**	*2.50*	0.130	*2.50*	17.8	*0.100*	*2.50*	0.0741	-0.454	*5.00*	*0.0300*	0.0741
MW-8	*3.90*	*5.00*	**1,020**	*0.500*	*0.500*	**16.6**	*2.50*	*0.0500*	*2.50*	23.5	*0.100*	*2.50*	1.06	0.568	*5.00*	*0.0300*	1.63

* Well was not sampled as it was dry.
** Constituents had all non-detects with the maximum method detection limit chosen as the BTV. The Double Quantification Rule is recommended for statistical evaluation.

Notes:
Italic concentration indicates a non-detect value
Underlined concentration indicates a detect value in the first DM round result for constituents with 100% background non-detects.
Bold and underlined concentration indicates an SSI over background.

HDR Engineering, Inc. of the Carolinas
440 S Church Street, Suite 1000
Charlotte, NC 28202-2075
704.338.6700
NC License F0116

hdrinc.com

© 2018 HDR, Inc., all rights reserved



HDR Engineering, Inc. of the Carolinas
440 S Church Street, Suite 1000
Charlotte, NC 28202-2075
704.338.6700
NC License F0116

hdrinc.com

© 2019 HDR, Inc., all rights reserved