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):

HDR Engineering, Inc. of the Carolinas (Consultant)

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

Name: William M. Miller Phone: 828-891-6296

E-mail: bill.miller@hdrinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Duke Energy Carolinas, LLC Marshall Steam Station Dry Ash Landfill	8320 East NC Highway 150 Terrell, NC 28682	1804	.0500	February 12, 2013

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.

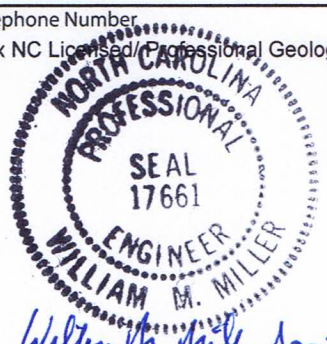
William M. Miller	Senior Engineer	(828) 891-6296
Facility Representative Name (Print)	Title	(Area Code) Telephone Number
William M. Miller	April 22, 2013	Affix NC Licensed/Professional Geologist Seal
Signature	Date	

440 S. Church Street Suite 1000, Charlotte, NC 28202

Facility Representative Address

F-0116

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



William M. Miller Apr 22, 2013

Revised 6/2009

SEMIANNUAL GROUNDWATER MONITORING REPORT

MARSHALL STEAM STATION

DRY ASH LANDFILL
PERMIT NO. 1804

FEBRUARY 2013 SAMPLING EVENT

Prepared for:
DUKE ENERGY CAROLINAS, LLC
8320 East NC Highway 150
Terrell, NC 28682

Prepared by:
HDR ENGINEERING, INC. OF THE CAROLINAS
Charlotte, North Carolina

April 22, 2013

REPORT VERIFICATION

PROJECT: **SEMIANNUAL GROUNDWATER MONITORING REPORT**
MARSHALL STEAM STATION
DRY ASH LANDFILL
PERMIT NO. 1804

TITLE: **FEBRUARY 2013 SAMPLING EVENT**

This document has been reviewed for accuracy and quality commensurate with the intended application.

Prepared by: _____ Date: April 22, 2013

Checked by: _____ Date: Apr 22, 2013

Approved by: _____ Date: 4/22/2013

Project Manager: Ty Ziegler, PE

Professional Engineer Seal:

NORTH CAROLINA PROFESSIONAL SEAL 17661 ENGINEER WILLIAM M. MILLER

_____ Apr 22, 2013

HDR Engineering, Inc. of the Carolinas
440 South Church St., Suite 1000
Charlotte, NC 28202
North Carolina Engineering Firm Number F-0116

SEMIANNUAL GROUNDWATER MONITORING REPORT
MARSHALL STEAM STATION
DRY ASH LANDFILL
PERMIT NO. 1804

FEBRUARY 2013 SAMPLING EVENT

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FIGURES

1. Site Location Map
2. Sample Locations
3. Generalized Groundwater Surface Contours

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1. Field Data Parameters
2. Field and Analytical Results
3. North Carolina Administrative Code (NCAC) 2L Groundwater Quality Exceedances

APPENDICES

A. Chain-of-Custody Forms

Section 1
Background

The Marshall Dry Ash Landfill is located at Marshall Steam Station which is owned and operated by Duke Energy Carolinas, LLC (Duke Energy). Marshall Steam Station is a four-unit, coal-fired generating facility, located on Lake Norman in Catawba County, North Carolina.

The Marshall Dry Ash Landfill consists of two separate disposal areas permitted in December 1983 under Department of Environment and Natural Resources (NCDENR) Solid Waste Permit No. 1804. Placement of flyash began in September 1984 in the area designated as Phase I. Phase I consists of approximately 14.5 acres and approximately 280,000 tons of flyash was placed between September 1984 and March 1986. Placement of ash in this area was completed around March 1986. Placement of ash in Phase II, approximately 46 acres, began around March 1986 and was completed in 1999.

The location of the landfill and nearby surrounding areas is shown on Figure 1. The landfill is located north of the power plant and south of Island Point Road. The Marshall Steam Station ash basin is located adjacent to the western boundary of the landfill.

The groundwater monitoring system for the Marshall Dry Ash Landfill consists of the following:

Monitoring Wells:	MW-1
	MW-2
	MW-3
	MW-4
	MW-5
Observation Well:	OB-1

The locations of the wells are shown on Figure 2. Monitoring wells MW-2, MW-3, and MW-5 are located adjacent to the 46-acre landfill. Monitoring well MW-1 and observation well OB-1 are located adjacent to the 14.5-acre landfill. Observation well OB-1 is only used to measure groundwater levels.

Monitoring well MW-4 is located upgradient from the 46-acre landfill and is described in the *Post-Closure Ground-Water Monitoring Program Sampling and Analysis Plan*[1] (SAP) as representing upgradient groundwater quality. All of the groundwater monitoring wells are screened to monitor the shallow aquifer.

[1] Marshall Steam Station Industrial Landfill-Phase II Permit #18-04 *Post-Closure Ground-Water Monitoring Program Sampling and Analysis Plan*. Dated September 20, 1999.

Section 2
Methods

2.1 Sampling and Analysis Methods

Groundwater sampling and documentation of sampling activities were performed by Duke Energy personnel. The groundwater samples were analyzed by Duke Energy Analytical Laboratory (North Carolina Laboratory Certification #248), Pace Analytical Services, Inc., Asheville (North Carolina Laboratory Certification #40) and Summit Environmental Technologies, Inc. (North Carolina Laboratory Certification #631).

The groundwater samples were analyzed for the following constituents and/or parameters:

- Select metals using U.S. Environmental Protection Agency (EPA) Method 200.7 and 200.8
- Mercury using EPA Method 245.1
- Total Dissolved Solids using Standard Method (SM) 2540C
- Chloride, fluoride, nitrate as nitrogen, and sulfate using EPA Method 300.0
- Biological oxygen demand using SM 5210B
- Chemical oxygen demand using the Hach Method 8000
- Total organic carbon using SM 5310C/EPA 9060A
- Total organic halide using EPA Method 9020

2.2 Statement of Work

HDR Engineering, Inc. (HDR) completed the following tasks:

- Received field sampling information provided by Duke Energy for monitoring wells MW-1, MW-2, MW-3, MW-4, and MW-5 and water level information for observation well OB-1. The samples were collected on February 12, 2013, and HDR received the data on February 28, 2013.

- Reviewed the laboratory analytical results for samples. The Electronic Data Deliverable (EDD), provided by Duke Energy, was adapted to conform to the format requirements of the NCDENR EDD template. HDR added an italicized J data qualifier (*J*) to indicate a detected concentration that attains or is greater than the laboratory's method reporting limit (MRL), but less than the Solid Waste Section Limit[2] (SWSL). A copy of the original EDD is retained in HDR's files.
- Developed a generalized groundwater surface contour map using map data and groundwater elevation data supplied by Duke Energy.
- Prepared and submitted this Semiannual Groundwater Monitoring Report to Duke Energy.

[2] Solid Waste Section Limits (SWSL) is defined by DENR as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy. The SWSL is the concentration below which reported results must be qualified as estimated. NCDENR Division of Waste Management Memorandum dated February 23, 2007.

Section 3
Results

3.1 Site Groundwater Flow

Generalized groundwater surface contours for the site are shown on Figure 3. These contours were developed using the measured groundwater elevations in the wells from the February 12, 2013 sampling, and using the approximate surface water elevations for the Marshall Ash Basin and the adjacent Lake Norman.

The ground surface in the area of the larger landfill slopes from the elevation along Island Point Road (located north of MW-4), approximate elevation 880 feet to 890 feet, downward toward the Marshall Ash Basin, which has a surface water elevation of approximately 790 feet. Lake Norman is located to the east of the Marshall Ash Basin. The normal pond elevation of Lake Norman is 760 feet.

Groundwater flow at the site is from areas of higher topography toward the ash basin and on toward Lake Norman. Monitoring well MW-4 is located north of the 46-acre landfill and is at the highest topographic elevation. Groundwater flow is generally from MW-4 toward the 46-acre landfill and to the ash basin. It is expected that flow would be from the topographically higher region north of MW-3 and MW-5 toward the 46-acre landfill, or in the case of MW-5, toward the portion of ash basin located to the east of the 46-acre landfill.

Based on an August 6, 2012 survey, monitoring well MW-2 is located approximately 100 feet within the landfill review boundary and approximately 25 feet to 30 feet outside the edge of waste.

The water elevation at monitoring well MW-3 is approximately the same as the pond elevation of two adjacent ponded areas. These ponded areas were part of the original ash basin and were cut off from the main body of the ash basin during construction of the 46-acre landfill.

Monitoring well MW-5 is located on the east side of the 46-acre landfill adjacent to an inactive portion of the ash basin. This inactive portion of the ash basin no longer contains appreciable free water and is filled with ash that was sluiced from the ash basin.

The groundwater flow in the region near the 14.5-acre landfill area appears to be from the ash basin (elevation 790 feet) toward the arm of Lake Norman (elevation 760 feet) located east of OB-1 and MW-1.

3.2 Analytical Results

A summary of the field data is presented in Table 1.

The field and laboratory results of groundwater sampling are summarized in Table 2.

A summary of the analytical results that attain or exceed the Title 15A NCAC 02L .0202 (g) Standards (2L Standards) are presented in Table 3.

Concentrations for constituents at sampling locations listed in Table 3 were measured in excess of the respective SWSLs with the following exceptions:

- pH- There is no SWSL for pH

Concentrations that attain or exceed their respective SWSLs but did not exceed the 2L Standards were measured at the following wells:

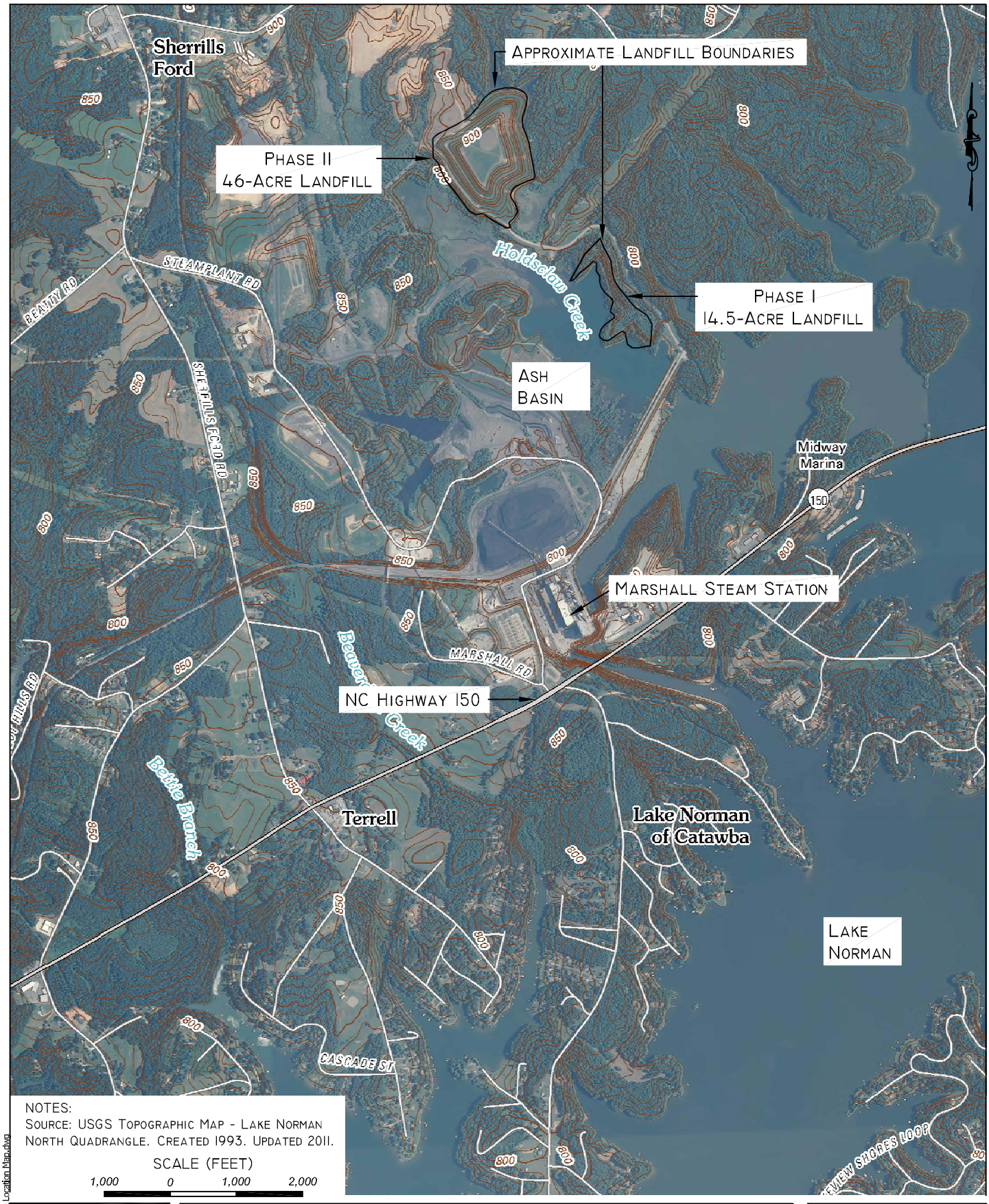
- Barium and zinc in MW-3

Selected samples were diluted as is normal laboratory practice to bring samples to the calibrated range of the analysis. Specifics regarding the samples that were diluted, including the dilution amount, are reported in the EDD.

The chain-of-custody forms can be found in Appendix A.

HDR prepared and submitted an assessment to NCDENR on historic exceedances of the 2L Standards at this landfill (*Groundwater Assessment, Marshall Steam Station, Dry Ash Landfill, December 21, 2012*). The report assessed 2L Standard exceedances for manganese at monitoring wells MW-3 and MW-5. The report concluded that the manganese exceedances at monitoring wells MW-3 and MW-5 were likely the result of naturally-occurring manganese and not caused by impacts from the landfill.

FIGURES



NOTES:
Source: USGS Topographic Map - Lake Norman North Quadrangle. Created 1993. Updated 2011.

SCALE (FEET)
1,000 0 1,000 2,000

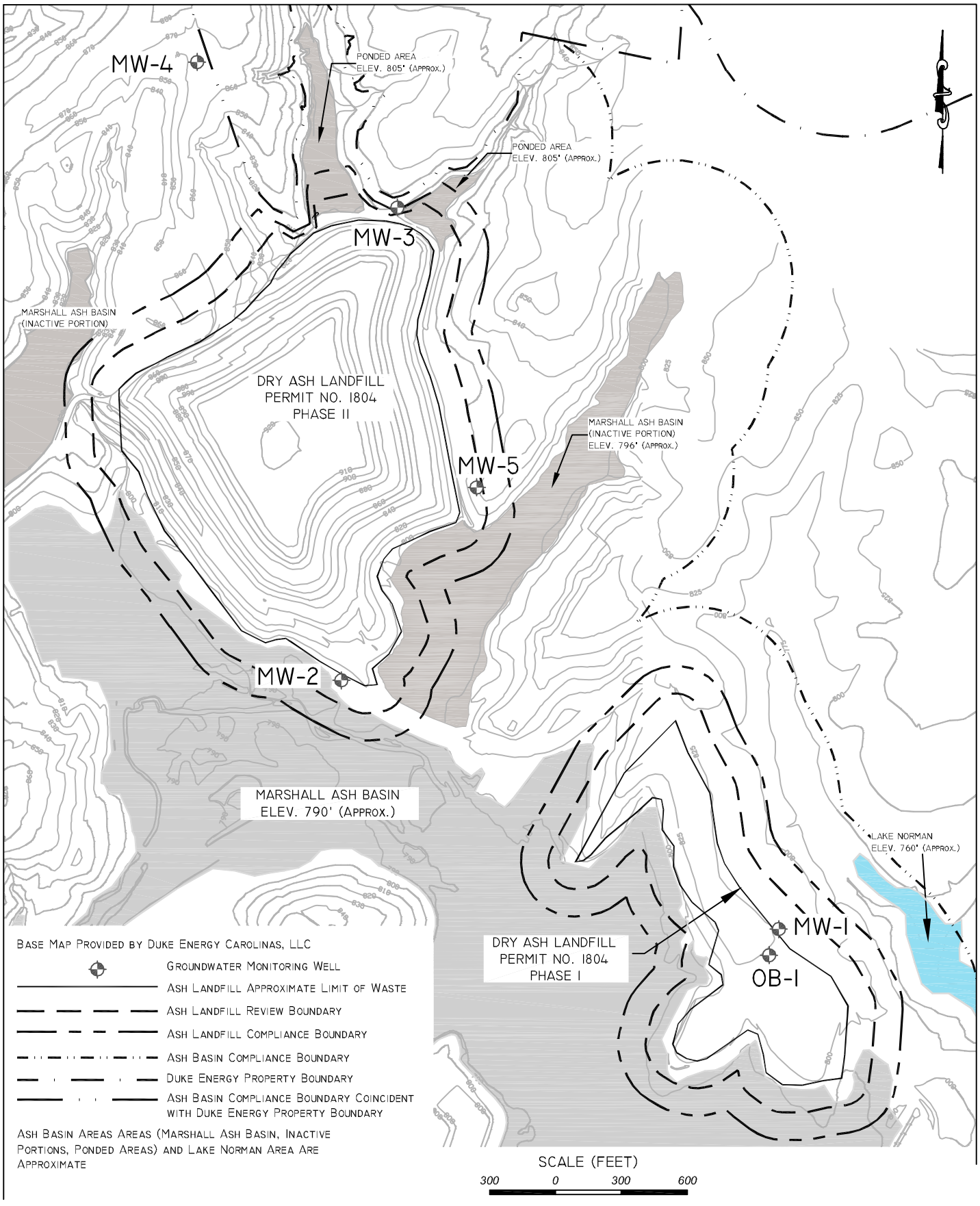
C:\pwworking\tma\d0437848\Site Location Map.dwg

HDR
HDR Engineering, Inc. of the Carolinas
License Number: F-0116
440 South Church Street Charlotte, NC 28202

SITE LOCATION MAP
MARSHALL STEAM STATION
DRY ASH LANDFILL
PERMIT NO. 1804

DATE
MAY XX, 2013

FIGURE
1



HDR Engineering, Inc.
of the Carolinas

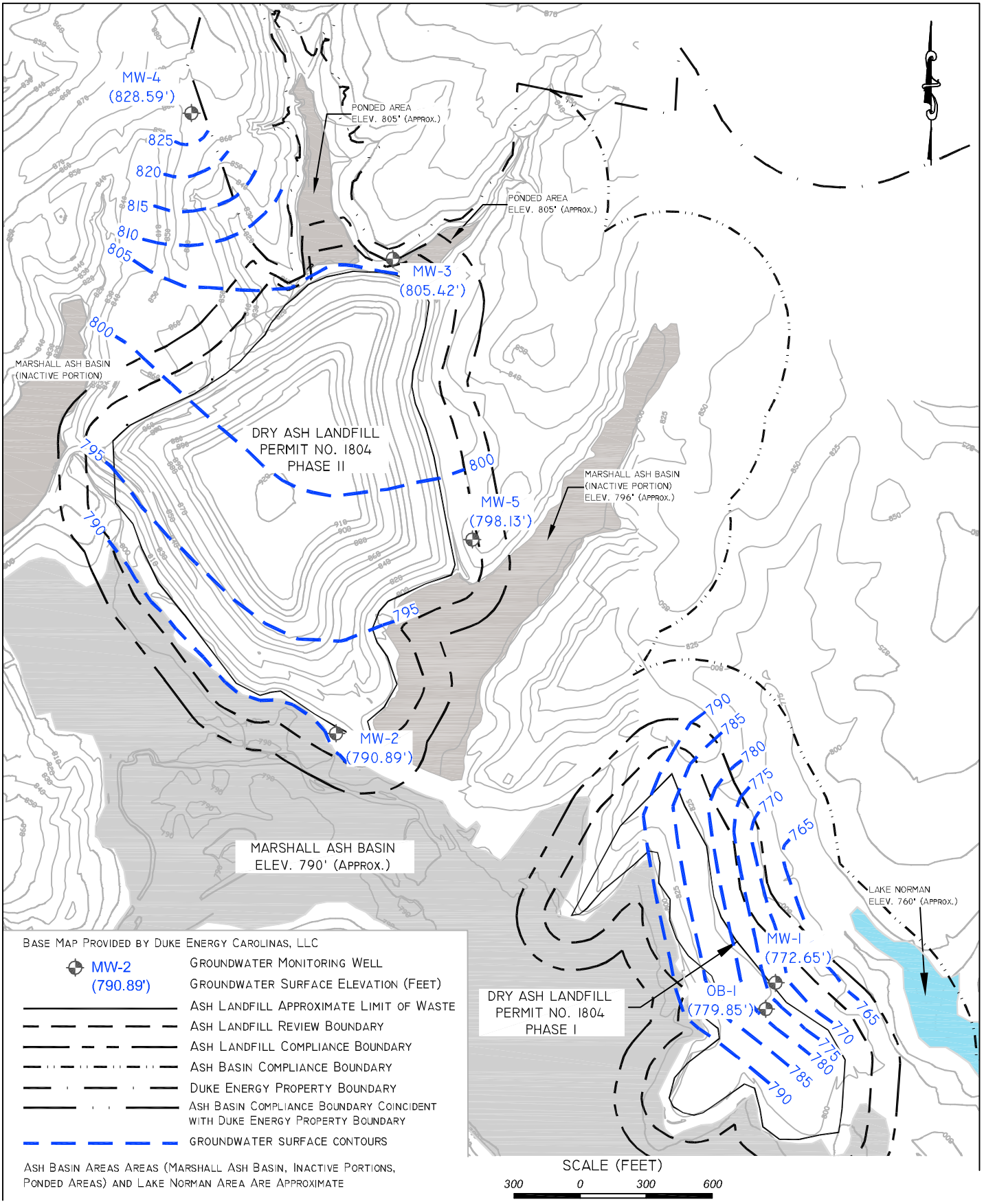
License Number: F-0116
440 South Church Street Charlotte, NC 28202

SAMPLE LOCATIONS
MARSHALL STEAM STATION
DRY ASH LANDFILL
PERMIT NO. 1804

DATE
APRIL 22, 2013

FIGURE
2

C:\pwworking\tpa\d0437848\Marshall Ash Landfill - Fig 2 & 3.dwg



GENERALIZED GROUNDWATER SURFACE CONTOURS FEBRUARY 12, 2013 MARSHALL STEAM STATION DRY ASH LANDFILL PERMIT NO. 1804

HDR Engineering, Inc.
of the Carolinas
License Number: F-0116
440 South Church Street Charlotte, NC 28202

DATE
APRIL 22, 2013

FIGURE
3

C:\pwworking\tpa\d0437848\Marshall Ash Landfill - Fig 2 & 3.dwg

TABLES

Table 1 - Field Data Parameters
Duke Energy Carolinas, LLC/Marshall Steam Station
Dry Ash Landfill - Permit No. 1804

DATE	WELL NO.	WELL DEPTH (feet)	DEPTH TO WATER (feet)	WATER ELEV. (feet)	APPEARANCE	ODOR	PURGE METHOD	PUMP RATE (ml/min)	WELL VOLUME (gal)	EVAC VOLUME (gal)	EVAC (yes/no)	TEMP (deg C)	SPECIFIC CONDUCTANCE (umho/cm)	pH (SU)	TURBIDITY (NTU)	ORP (mV-NHE)	DO (mg/L)
2/12/2013	MW-1	78.75	51.05	772.65	Normal	None	CP	N/A	4.52	14.25	NO	15.46	126	5.7	2.3	393	0.91
2/12/2013	MW-2	35.10	6.33	790.89	Normal	None	CP	N/A	4.69	14.25	NO	16.09	373	5.2	1.5	425	1.13
2/12/2013	MW-3	28.15	7.65	805.42	Normal	None	CP	N/A	3.34	14.00	NO	16.25	94	4.8	1.8	456	2.89
2/12/2013	MW-4	50.20	38.79	828.59	Normal	None	CP	N/A	1.86	2.75	YES	14.33	45	5.8	3.0	394	9.52
2/12/2013	MW-5	30.71	24.56	798.13	Normal	None	CP	N/A	1.00	3.00	NO	14.89	37	5.4	2.2	430	1.94
2/12/2013	OB-1	65.50	46.00	779.85	N/A	N/A	LO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. Purge Methods; LF=Low Flow, CP=Conventional Purge (3-5 well volumes), NP=No Purge (HydraSleeve), LO=Level Only.
2. Field sampling performed by Duke Energy Carolinas, LLC personnel.
3. umho/cm indicates micromhos per centimeter.
4. SU indicates Standard Units.
5. NTU indicates Nephelometric Turbidity Units.
6. mV-NHE indicates millivolts-Normal Hydrogen Electrode.
7. Information provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 28, 2013.
8. N/A indicates not applicable.

Table 2 - Groundwater Field and Analytical Results
Duke Energy Carolinas, LLC/Marshall Steam Station
Dry Ash Landfill - Permit No. 1804

Sample Date: February 12, 2013

Field Sampling performed by Duke Energy Carolinas, LLC

Laboratory Certificate Codes:
Duke Energy Carolinas, LLC Field #5193
Duke Energy Analytical Laboratory #248
Pace Analytical Services, Inc. #40
Summit Environmental Technologies, Inc. #631

Parameter	SWS ID	Units	Certificate Code	Monitoring Wells					1804 Field Blank	SWSL	15A NCAC 2L Standard
				1804 MW-1	1804 MW-2	1804 MW-3	1804 MW-4	1804 MW-5			
Field pH	320	SU	5193	**5.7**	**5.2**	**4.8**	**5.8**	**5.4**	-	-	6.5-8.5
Field Specific Conductivity	323	umho/cm	5193	126	373	94	45	37	-	-	-
Temperature	325	°C	5193	15.46	16.09	16.25	14.33	14.89	-	-	-
Top of Casing	328	feet	-	823.70	797.22	813.07	867.38	822.69	-	-	-
Depth to Water	318	feet	-	51.05	6.33	7.65	38.79	24.56	-	-	-
Water Elevation	319	feet	-	772.65	790.89	805.42	828.59	798.13	-	-	-
Well Depth	411	feet	-	78.75	35.10	28.15	50.20	30.71	-	-	-
Arsenic	14	ug/L	248	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	10	10
Barium	15	ug/L	248	66.03 J'	54.46 J'	314.36	45.85 J'	46.69 J'	3.34 U	100	700
Biological Oxygen Demand, 5-day	316	ug/L	40	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	-	NE	NE
Boron	428	ug/L	248	353.26	**2,981**	33.35 U	33.35 U	33.35 U	33.35 U	NE	700
Cadmium	34	ug/L	248	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	1	2
Chloride	455	ug/L	248	2,839.4	4,852.5	9,627.2	1,849.9	2,968.2	36.7 J	NE	250,000
Chromium	51	ug/L	248	8.53 J'	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	10
Chemical Oxygen Demand	317	ug/L	248	3,780 U	3,780 U	3,780 U	3,780 U	3,780 U	3,780 U	NE	NE
Copper	54	ug/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	1,000
Fluoride	312	ug/L	248	136 J'	118.5 J'	84.4 J	122.3 J'	81.1 J	36.8 J	2,000	2,000
Iron	340	ug/L	248	54.67 J'	9.9 J	10.49 J'	18.48 J'	44.04 J'	6.67 U	300	300
Lead	131	ug/L	248	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	10	15
Manganese	342	ug/L	248	7.27 J'	12.63 J'	**54.2**	3.34 U	30.36 J'	3.34 U	50	50
Mercury	132	ug/L	248	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2	1
Nickel	152	ug/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	50	100
Nitrate as Nitrogen	303	ug/L	248	128.47 J'	490.88 J'	6,216.37 J'	41.17 J'	5.4 U	5.4 U	10,000	10,000
Selenium	183	ug/L	248	2.47 J'	**28.72**	0.67 U	0.67 U	0.67 U	0.67 U	10	20
Silver	184	ug/L	248	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	3.34 U	10	20
Sulfate	315	ug/L	248	36,503 J'	147,610 J'	87.4 J	130.8 J'	41.1 J	18 U	250,000	250,000
Total Dissolved Solids	311	ug/L	248	103,000	277,000	56,000	49,000	51,000	-	NE	500,000
Total Organic Carbon	357	ug/L	248	180	422	117	158	180	34 J	NE	NE
Total Organic Halide	396	ug/L	631	100 U	100 U	100 U	100 U	100 U	100 U	NE	NE
Zinc	213	ug/L	248	5.23 J'	5.13 J'	18.01	3.34 U	3.34 U	3.34 U	10	1,000

Notes:

1. Concentrations presented in micrograms per liter (µg/L), except where noted.
2. SWS ID is the Solid Waste Section Identification Number.
3. SWSL is the Solid Waste Section Limit. NCDENR defines the SWSL as the lowest amount of analyte in a sample that can be quantitatively determined with suitable precision and accuracy.
4. 15A NCAC 2L Standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2L - Groundwater Classifications and Standards," NCDENR (last amended on January 1, 2010), Appendix I revised July 16, 2012
5. Grayed values indicate values that attain or exceed the SWSL Standard.
6. Bold values indicate values that attain or exceed the 15A NCAC 2L Standard.
7. NE indicates not established. Blank cells indicate that there is no information relevant to the respective row.
8. Qualifiers in non-italicized text are laboratory data qualifiers or "flags". "U" is used for parameters not detected at concentrations above the method detection limit (MDL). "J" is used for parameters detected at estimated concentrations greater than the MDL but less than the laboratory's method reporting limit (MRL). An italicized *J'* -flag is a data qualifier, added by HDR to indicate a detected concentration which attains or is greater than the laboratory's MRL but less than the SWSL.
9. According to the Constituent Look-up webpage on the NCDENR Division of Waste Management webpage, there is no SWSL or 2L Standard for choride associated with CAS number 16887-00-6, which is the CAS reported by the laboratory for the analyses completed. Therefore, the SWSL and 2L listed are for the chloride with CAS number SW301 as specified on the Constituent Look-up webpage (last updated June 13, 2011).
10. Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas, LLC on February 28, 2013.
11. SU indicates Standard Units.
12. umho/cm indicates micromhos per centimeter.

Table 3 - Field and Analytical Results that Equal or Exceed NCAC 2L Groundwater Quality Standards
Duke Energy Carolinas, LLC/Marshall Steam Station
Dry Ash Landfill - Permit No. 1804

Sample Date: February 12, 2013						
Parameter	**Well ID**	**Result**	**Units**	**15A NCAC 2L Standard**	**Historic Concentrations**	**Cause and Significance**
pH	MW-1	5.7	SU	6.5 - 8.5	5.2 - 6.2	pH consistent with historic readings at MW-1.
	MW-2	5.2	SU		5.1 - 6.1	pH consistent with historic readings at MW-2.
	MW-3	4.8	SU		4.4 - 5.4	pH consistent with historic readings at MW-3.
	MW-4	5.8	SU		5.1 - 6.3	pH consistent with historic readings at MW-4.
	MW-5	5.4	SU		5.1 - 5.8	pH consistent with historic readings at MW-5.
Boron	MW-2	2,981	µg/L	700	2,175 - 3,030	Boron concentration is consistent with historic readings at MW-2. Monitoring well MW-2 is located approximately 100 feet within the landfill review boundary and approximately 25 feet to 30 feet outside of the edge of waste.
Manganese	MW-3	54.2	µg/L	50	54.2 - 176.0	Manganese concentration is the lowest at MW-3 over the period of monitoring.
Selenium	MW-2	28.72	µg/L	20	<1 - 44.05	Selenium concentration consistent with historic readings at MW-2. Monitoring well MW-2 is located approximately 100 feet within the landfill review boundary and approximately 25 feet to 30 feet outside of the edge of waste.

Notes:

1. 15A NCAC 2L Standard is from "North Carolina Administrative Code, Title 15A: Department of Environment and Natural Resources, Subchapter 2L - Groundwater Classifications and Standards," NCDENR (last amended on January 1, 2010).
2. Data obtained from Electronic Data Deliverable (EDD) provided by Tim Hunsucker of Duke Energy Carolinas on February 28, 2013.
3. µg/L indicates micrograms per liter.
4. SU indicates Standard Units.
5. Historic concentrations based on data in Duke Energy Carolinas, LLC (Duke Energy) analytical results database.

APPENDICES

APPENDIX A
CHAIN-OF-CUSTODY FORMS

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST FORM

Duke Energy

For Detailed Instructions, see:
http://dewww/essenv/coc/

Duke Energy Analytical Lab Services
Mail Code MGO3A2 (Building 7405)
13339 Hagers Ferry Rd
Huntersville, N. C. 28078
(980) 875-5245
Fax: (980) 875-5038

Analytical Laboratory Use Only

LIMS # J13020086 | MATRIX: GW-RCRA | Samples Originating From NC_√_ SC___

Logged By JT | Date & Time 2/5/13 1435 | SAMPLE PROGRAM Water √ Ground NPDES Drinking Water UST RCRA Waste

VENDOR PACE | Cooler Temp (C) 3.1

[19]Page 1 of 1

DISTRIBUTION
ORIGINAL to LAB,
COPY to CLIENT

Revised 10/2/12

Customer must Complete

1)Project Name: MARSHALL DRY ASH LANDFILL Permit #18-04 | 2)Phone No: 980-875-5257

3)Client: LDC / TSH / Ed Sullivan | 4)Fax No:875-4349

5)Business Unit: 20035 | 6)Process: ENVWT | 7)Resp. To: MS00

8)Project ID: | 9)Activity ID: | 10)Mail Code: MGO3A3

PO # | MR #

[15]Preserv.: 1=HCL 2=H_2SO_4 3=HNO_3 4=Ice 5=None

Customer to complete all appropriate NON-SHADED areas.

LAB USE ONLY [11]Lab ID	[13]Sample Description or ID	[14]Collection Information Date	Time	Signature	[18]TESTS	[18]Grab	NO3-N, Cl, F, SO4 (IC) 4	lab pH, F_Alk (4.5) 2, 4	TOC, COD	Metals Prep - 3030C (ICP - EPA 200.7) Ag, B, Ba, Ca, Cu, Cr, Fe, K, Mg, Mn, Na, Ni, Zn (13) Hg (EPA 245.1) (1) (IMS - EPA 200.8) As, Cd, Pb, Se (4) 3	TOX - Pace w/ St EDD 2, 4	BOD - Pace w/ St EDD 4	TDS 4	Chlorine (ppm)	[20]Total # of Containers
															VOC
2013002890	MW-1	2/12/13	1240	VOC	11	X	1	1		1	1	1	1	Ø	7 6
2013002891	MW-2	2/12/13	1145	VOC	11	X	1	1		1	1	1	1	Ø	7 6
2013002892	MW-3	2/12/13	0945	VOC	11	X	1	1		1	1	1	1	Ø	7 6
2013002893	MW-4	2/12/13	0735	VOC	11	X	1	1		1	1	1	1	Ø	7 6
2013002894	MW-5	2/12/13	1045	VOC	11	X	1	1		1	1	1	1	Ø	7 6
2013002895	QC SAMPLE (WELL # MW-3)	2/12/13	0945	VOC	1							1		Ø	1
2013002896	FIELD BLANK	2/12/13	1310	VOC	9	X	1	1		1	1			n/a	5 4

Customer to complete appropriate columns to right

Customer to sign & date below

21)Relinquished By: LD	Date/Time: 2/12/13 1415	Accepted By:	Date/Time: 2-12-13 1415
Relinquished By	Date/Time	Accepted By:	Date/Time
Relinquished By	Date/Time	Accepted By:	Date/Time
23)Seal/Locked By	Date/Time	Sealed/Lock Opened By	Date/Time

24)Comments: Regulatory Agency : NCDENR/DWM -SW Section - State EDD Fomat Required NOTE: As, Cd, Pb, Se - analyzed by IMS - All other metals analyzed by ICP.

Customer, please indicate important desired turnaround

[22]Requested Turnaround

14 Days √

*7 Days

*48 Hr

*Other * Add. Cost Will Apply