Duke Energy®

Fac/Perm/Co ID #	Date	Doc ID#
1804	8/22/11	DIN 14891

CORPORATE EHS SERVICES

Duke Energy Corporation
526 South Church St.
Charlotte, NC 28202

Mailing Address:
EC13K / PO Box 1006
Charlotte, NC 28201-1006

September 15, 2008

Mr. Donald Herndon
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Solid Waste Section
1646 Mail Service Center
Raleigh, N.C. 27699-1646

DENR RECEIVED SEP 16 2008 SOLID WASTE SECTION

Subject: Duke Energy Carolinas – Marshall Steam Station
Unlined Solid Waste Landfill (Permit # 18-04)
Semi-Annual Groundwater Monitoring Report

Dear Mr. Herndon:

Attached is the groundwater monitoring report for Marshall Steam Station's solid waste landfill (Permit # 18-04). Groundwater sampling for the landfill occurred on August 12, 2008.

Groundwater contours are shown in Figure 1 and show groundwater flow generally to the southeast. Groundwater elevations, pH, specific conductance, temperature and laboratory results are tabled in the Groundwater Monitoring Report. The Groundwater Monitoring Report (Table 1) has been revised to comply with guidelines outlined in the February 23, 2007 NCDENR memorandum.

In general, groundwater analytical results were very similar to those previously reported. With the exceptions of pH in all five monitoring wells (4.6 to 5.6 range), boron (MW-1: 733 ug/l and MW-2: 2240 ug/l), iron (MW-4: 441 ug/l) and manganese (MW-3: 62 ug/l and MW-5: 60 ug/l), all other parameters were within limits set forth in the NCAC 2L groundwater standards.

Values for pH have historically been below the groundwater standard of 6.5 pH units and are attributed to soil characteristics surrounding the landfill. Boron in the downgradient wells MW-1 and MW-2 is likely a result of landfill and/or ash basin influences. Wells MW-1 and MW-2 are located within the compliance boundary of the station's ash basin. Iron, at 441 ug/l in MW-4, is slightly over the 2L standard and is a relatively common occurring exceedance in the region. Manganese exceedances of the 50 ug/l 2L standard are also relatively common in the Piedmont region. Exceedance of the 2L standard for manganese at MW-3 has periodically occurred while the 60 ug/l concentration at MW-5 was the second recorded exceedance to date.

Included with this report is a copy of the chain of custody and a sealed copy of the Environmental Monitoring Reporting Form. An electronic copy of this report will also be submitted along with an excel file of the laboratory data in the EDD format. The next sampling event scheduled for this landfill will take place in February 2009. If there are any questions regarding this report, please contact me at (980) 373-7892.

Sincerely,

Christopher D. Hallman

Christopher D. Hallman
Waste and Remediation Management
Duke Energy Corporate EHS

Attachments

cc w/att: D.L. Burrell
J.A. Stowe
D.E.M. Sullivan

Record Number: 497585

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).
- In accordance with NC General Statutes Chapter 89C and 89E and NC Solid Waste Management Rules 15A NCAC 13B, be sure to affix a seal to the bottom of this page, when applicable.
- 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):

Duke Energy (facility owner)

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

Name: Tim Hunsucker Phone: 704-875-5228

E-mail: tshunsuc@duke-energy.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Marshall Steam Station Dry Ash Landfill	8320 East Hwy 150 Catawba County, NC	18-04	.0500	August 12, 2008

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.

Christopher D. Hallman Senior Engineer (980) 373-7892

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

Christopher D Hallman 9-18-08

Signature Date

Affix NC Licensed/Professional Geologist/Engineer Seal here:

NORTH CAROLINA PROFESSIONAL SEAL 12584 ENGINEER CHRISTOPHER D. HALLMAN

Revised 01/2007

DUKE ENERGY
GROUNDWATER MONITORING REPORT

September 8, 2008

Table 1

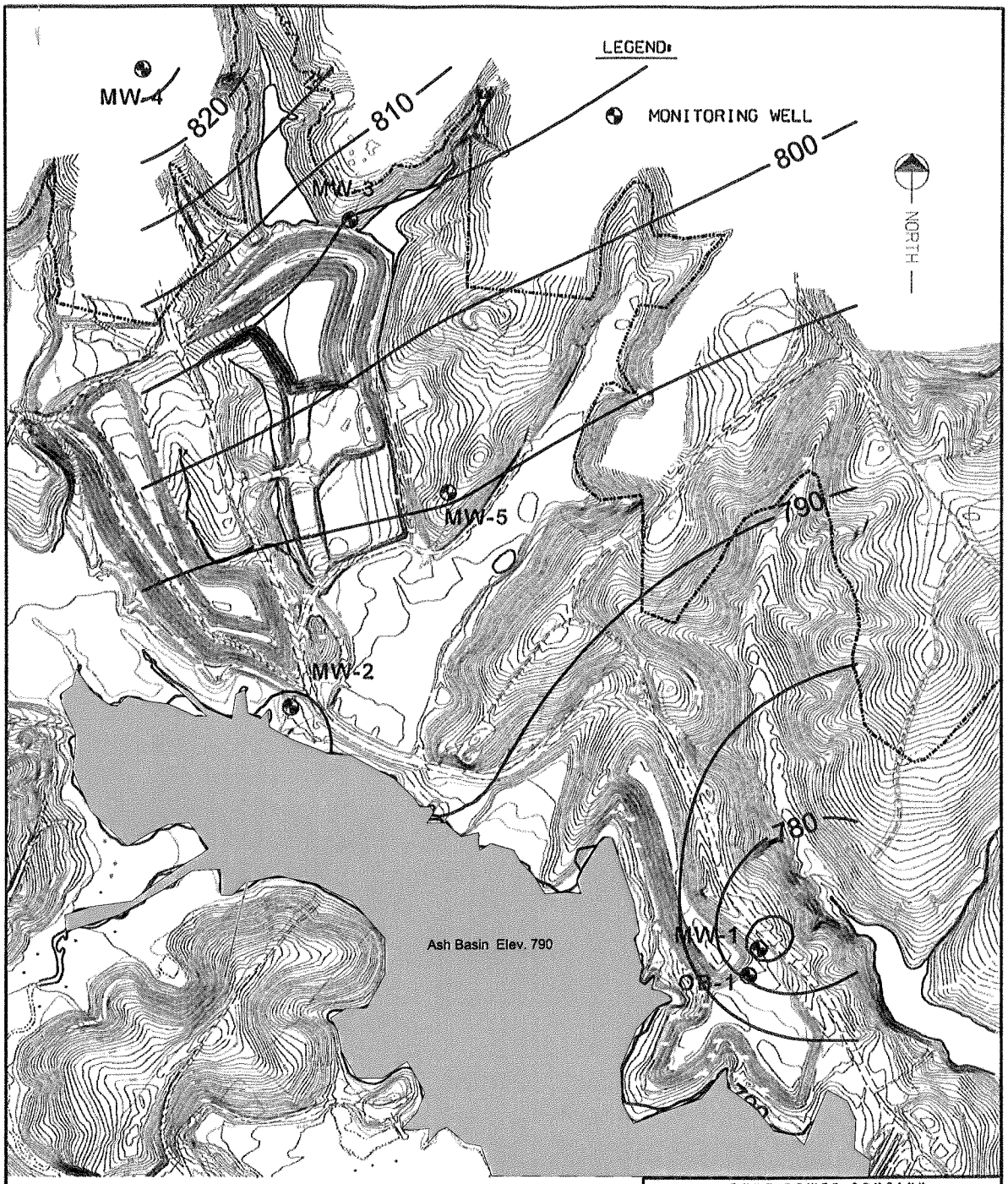
Facility: Marshall Steam Station Dry Ash Landfill #18-04
Sample Date: August 12, 2008 (Field and Geochemistry Data)

Certificate Codes:

Duke Power Lab # 248
Duke Power Field # 5193
Pace Analytical # 12

Parameter	SWS ID	Units	Certificate Codes	Monitoring Well Identification						FIELD BLANK	SWSL	15A NCAC 2L MCL*
				1804-MW-1	1804-MW-2	1804-MW-3	1804-MW-4	1804-MW-5	1804-OB-1			
Field pH	320	Std. Units	5193	5.6	5.2	4.6	5.6	5.4				6.5-8.5
Field Spec. Conductance	323	umho/cm	5193	160	298	102	47	41				
Temperature	325	C	5193	15	16	16	16	17				
Top Casing	328	msl-feet		823.70	797.22	813.07	867.15	822.69	825.85			
Depth to Water	318	feet		51.28	7.57	8.24	39.35	27.31	46.17			
Water Elevation	319	msl-feet		772.42	789.65	804.83	827.80	795.38	779.68			
Well Depth	41	feet		78.75	35.10	28.15	50.20	30.71	65.50			
Arsenic	14	ug/L	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	10	50
Barium	15	ug/L	12	80	61	365	52	53		5.0 U	100	2000
Boron	NE	ug/L	12	733	2240	50	50 U	50 U		50 U	NE	315
BOD	316	ug/L	12	2000 U	2000 U	2000 U	2000 U	2000 U			NE	NE
Cadmium	34	ug/L	12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		1.0 U	1.0	1.75
Chemical Oxygen Demand	317	ug/L	12	25000 U	25000 U	25000 U	25000 U	25000 U		25000 U	NE	NE
Chloride	301	ug/L	12	5000 U	5600	11600	5000 U	5000 U		5000 U	NE	250000
Chromium	51	ug/L	12	6.8	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	10	50
Copper	54	ug/L	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	10	1000
Fluoride	312	ug/L	12	100 U	100 U	100 U	100 U	100 U		100 U	2000	2000
Iron	340	ug/L	12	53	50 U	103	441	88		50 U	300	300
Lead	131	ug/L	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	10	15
Manganese	342	ug/L	12	6.6	8.6	62	11	60		5.0 U	50	50
Mercury	132	ug/L	12	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		0.20 U	0.20	1.05
Nickel	152	ug/L	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	50	100
Nitrate (as Nitrogen)	303	ug-N/L	12	110	460	7000	100 U	100 U		100 U	1000	10000
Selenium	183	ug/L	12	10 U	27	10 U	10 U	10 U		10 U	10	50
Silver	184	ug/L	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U		5.0 U	10	17.5
Sulfate	315	ug/L	12	42900	97900	5000 U	5000 U	5000 U		5000 U	250000	250000
Total Dissolved Solids	311	ug/L	12	138000	240000	76000	60000	56000			NE	500000
Total Organic Carbon	357	ug/L	12	3700	10200	3400	4200	5400		1000 U	NE	NE
Total Organic Halogen	396	ug/L	12	1000 U	1000 U	1000 U	1000 U	1000 U		1000 U	NE	NE
Zinc	213	ug/L	12	10 U	10 U	14	10 U	10 U		10 U	10	1050

*** Maximum Contaminant Level (MCL)**
U - Below adjusted reporting limit
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
NE - Not Established



500 0 500 1000 1500

SCALE IN FEET

DUKE POWER COMPANY

MARSHALL STEAM STATION

August 2008 Groundwater Contours

SOLID WASTE LANDFILL #18-04

FIGURE: 1

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
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only

LIMS # 08-JUL-0362 | Sample Class GWATER | Samples Originating From NC √ SC ___

Logged By VS | Date & Time 7/16/08 12:53

SAMPLE PROGRAM: Ground Water √ NPDES ___ Drinking Water ___ UST ___ RCRA Waste ___

VENDOR: PACE | Cooler Temp (C): <3°C

PO #: ISW01.341

MR #:

[19] Page 1 of 1

DISTRIBUTION: ORIGINAL to LAB, COPY to CLIENT

Customer must Complete

1) Project Name: MARSHALL LANDFILL | 2) Phone No: 875-5257

3) Client: LDC / TSH / C. Hallman | 4) Fax No: 875-5032

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

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

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

Customer to complete all appropriate NON-SHADED areas.

Customer to complete appropriate columns to right

LAB USE ONLY [11] Lab ID	[12] Chem Desktop No.	[13] Sample Description or ID	[14] Collection Information Date	Time	Signature	[16] Analyses Required [17] Comp.	[18] Grab	Alk, SO4, lab pH, NO3, Cl, Fluoride (4)	TOC (2, 4)	Hg (3)	METALS (Ag, As, B, Ba, Ca, Cd, Cr, K, Mg, Na, Ni, Pb, Se, Cu, Fe, Mn, Zn) (3)	COD (2, 4)	TOX (√) (2, 4)	BOD (√) (4)	TDS (4)	Chlorine (ppm)	[20] Total # of Containers
28019983		MW-1	8/12/08	0750	LD Cell		X	1	1	1	1	1	1	1	1	Ø	8
28019984		MW-2	8/12/08	0830	LD Cell		X	1	1	1	1	1	1	1	1	Ø	8
28019985		MW-3	8/12/08	0940	LD Cell		X	1	1	1	1	1	1	1	1	Ø	8
28019986		MW-4	8/12/08	1050	LD Cell		X	1	1	1	1	1	1	1	1		8
28019987		MW-5	8/12/08	1015	LD Cell		X	1	1	1	1	1	1	1	1	Ø	8
28019988		QC SAMPLE (WELL # MW-1)	8/12/08	0750	LD Cell									1		Ø	1
28019989		FIELD BLANK	8/12/08	1110	LD Cell		X	1	1	1	1	1	1			n/a	6

Please put the results into the correct EDD format as 'dictated' by the state of NC.

Customer to sign & date below

21) Relinquished By: [signature]	Date/Time: 8-12-08 1250	Accepted By: [signature]	Date/Time: 8-12-08 12:50
Relinquished By: EB Calder 8-12-08	Date/Time: 13:54	Accepted By: [signature] pace	Date/Time: 8-12-08 13:54
Relinquished By:	Date/Time:	Accepted By:	Date/Time:
23) Seal/Locked By: [signature]	Date/Time: 8-12-08 13:00	Sealed/Lock Opened By:	Date/Time:
24) Comments:			

Customer, important please indicate desired turnaround

[22] Requested Turnaround

14 Days √

*7 Days ___

*48 Hr ___

*Other ___

* Add. Cost Will Apply

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
(704) 875-5245
Fax: (704) 875-5038

Analytical Laboratory Use Only

LIMS # 08-JUL-0362 | Sample Class GWATER | Samples Originating From NC ✓ SC ___

Logged By VS | Date & Time 7/16/08 12:53

SAMPLE PROGRAM: Ground Water ✓ NPDES ___ Drinking Water ___ UST ___ RCRA Waste ___

VENDOR: PACE | Cooler Temp (C): <3°C

PO #: ISW01.341

MR #:

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

[19] Page 1 of 1

DISTRIBUTION: ORIGINAL to LAB, COPY to CLIENT

9225378

Customer must Complete

1) Project Name: MARSHALL LANDFILL | 2) Phone No: 875-5257

3) Client: LDC / TSH / C. Hallman | 4) Fax No: 875-5032

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

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

Customer to complete all appropriate NON-SHADED areas.

Complete appropriate columns to right

LAB USE ONLY [11] Lab ID	[12] Chem Desktop No.	[13] Sample Description or ID	[14] Collection Information Date	Time	Signature	[17] Comp.	[18] Grab	Alk, SO4, lab pH, NO3, Cl, Fluoride (4)	TOC (2, 4)	Hg (3)	METALS (Ag, As, B, Ba, Ca, Cd, Cr, K, Mg, Na, Ni, Pb, Se, Cu, Fe, Mn, Zn) (3)	COD (2, 4)	TOX (2, 4)	BOD (4)	TDS (4)	Chlorine (ppm)	[20] Total # of Containers
28019983	001	MW-1	8/12/08	0750	LD Gill		X	1	1	1	1	1	1	1	1	Ø	8
28019984	002	MW-2	8/12/08	0830	LD Gill		X	1	1	1	1	1	1	1	1	Ø	8
28019985	003	MW-3	8/12/08	0940	LD Gill		X	1	1	1	1	1	1	1	1	Ø	8
28019986	004	MW-4	8/12/08	1050	LD Gill		X	1	1	1	1	1	1	1	1		8
28019987	005	MW-5	8/12/08	1015	LD Gill		X	1	1	1	1	1	1	1	1	Ø	8
28019988	007	QC SAMPLE (WELL # MW-1)	8/12/08	0750	LD Gill									1		Ø	1
28019989	006	FIELD BLANK	8/12/08	1110	LD Gill		X	1	1	1	1	1	1			n/a	6

PLEASE!!
Send pdf and excel spreadsheet of vendor results to: labcustomer@duke-energy.com

Please put the results into the correct EDD format as 'dictated' by the state of NC.

Customer to sign & date below

21) Relinquished By: [signature]	Date/Time: 8-12-08 1250	Accepted By: [signature]	Date/Time: 8-12-08 12:50
Relinquished By: EB Calder	Date/Time: 8-12-08 13:54	Accepted By: [signature] Pace	Date/Time: 8-12-08 13:54
Relinquished By: [signature]	Date/Time: 8-12-08 14:13	Accepted By: [signature]	Date/Time: 8/12/08 14:13
23) Seal/Locked By: [signature]	Date/Time: 8-12-08 13:00	Sealed/Lock Opened By	Date/Time

24) Comments

Customer, important please indicate desired turnaround

[22] Requested Turnaround
- 14 Days ✓
- *7 Days ___
- 48 Hr ___
- *Other ___

* Add. Cost Will Apply