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):

S&ME, Inc. (Consultant)

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

Name: William M. Miller, P.E. Phone: 828-687-9080

E-mail: wmiller@smeinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Duke Energy McGuire Nuclear Station Landfill #2	13339 Hagers Ferry Road Huntersville, NC 28078	60-04	.0500	December 7, 2009

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, P.E. | Senior Project Engineer | 828-687-9080

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

William M. Miller | February 18, 2010 | Affix NC Licensed/ Professional Geologist Seal

Signature | Date

NORTH CAROLINA PROFESSIONAL SEAL 17661 ENGINEER WILLIAM M. MILLER

44 Buck Shoals Rd, Suite C-3, Arden, NC 28704

Facility Representative Address

F-0176

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

SEMI-ANNUAL
GROUNDWATER MONITORING REPORT
DECEMBER 2009 SAMPLING EVENT
DUKE ENERGY MCGUIRE NUCLEAR STATION
LANDFILL #2 PERMIT #60-04

S&ME Project No. 1411-09-047

Prepared For:

Prepared By:

S&ME, Inc.
44 Buck Shoals Road Suite C-3
Arden, North Carolina 28704

February 18, 2010

February 18, 2010

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

Reference: **Semi-Annual Groundwater Monitoring Report**
December 2009 Sampling Event
Duke Energy McGuire Nuclear Station
Landfill #2 (Permit # 60-04)
S&ME Project No. 1411-09-047

Dear Ms. Drummond:

This report presents the semi-annual groundwater monitoring for the McGuire Nuclear Station Landfill #2 (Permit #60-04). The landfill is located at Duke Energy's McGuire Nuclear Station near Huntersville, NC, in Mecklenburg County. Groundwater sampling for the landfill was performed on December 7, 2009. S&ME is submitting this report on the behalf of Duke Energy.

This report includes a brief discussion of the landfill and groundwater monitoring activities, a figure showing groundwater contours at the site, a summary of the analytical results, and preliminary evaluation of values in excess of the NCAC 2L groundwater standards. Also attached is the Environmental Monitoring Reporting Form. An EXCEL file containing the laboratory results in the Electronic Data Deliverable format will be sent to you by e-mail.

If you have questions or require additional information, please contact us at 828-687-9080.

Sincerely,

S&ME, Inc.

Scott Spinner
Staff Professional

William M. Miller, P.E.
Senior Project Engineer

NORTH CAROLINA PROFESSIONAL SEAL 17661 ENGINEER WILLIAM M. MILLER

Senior Review by: Larry Armstrong, P.E.

North Carolina Professional Engineering Firm License No. F-0176

S:\2009 PROJECTS\1411\ENVIRONMENTAL PROJECTS\11 09 047 Duke Energy Landfills - GW Reports\MNS LF #2\February 2010 Report (Dec 2009 Data)\DRAFT Report\MNS LF #2 -Report Final (Dec. 2009 Data).doc

cc:

Duke Energy
PO Box 1006
Charlotte, NC 28201-1006
Attn: Mr. Andy Tinsley - Mail Code EC13K

Duke Energy
McGuire Nuclear Station
13339 Hagers Ferry Rd.
Huntersville, NC, 28078
Attn: Mr. Robert Sapp

Mr. Dale Dusenbury
NCDENR Radiation Protection Section
1645 Mail Service Center
Raleigh, NC 27699-1645

Joseph S. Hack, QEP
Solid Waste Management
Mecklenburg County
700 N. Tryon Street
Charlotte, NC 28202

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FIGURES

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Figure 2: Groundwater Surface Contours December 2009

Chain of Custody Form

1.0 BACKGROUND

The McGuire Nuclear Station Landfill #2 is located at the Duke Energy McGuire Nuclear Station, in Mecklenburg County, NC. The landfill is permitted to accept specified waste from McGuire Nuclear Station and non-hazardous waste from petroleum spills. The landfill was constructed with an HDPE synthetic liner and with a leachate collection and removal system. Leachate and contact stormwater are collected in a lined leachate collection basin and pumped to the McGuire Nuclear Station wastewater treatment system. The landfill is permitted under NCDENR Solid Waste Permit #60-04.

The landfill and nearby area is portrayed on **Figure 1.** The landfill is located south of highway NC 73, north of Cashion Road, and to the west of Linderman Road. Cashion Road runs along a surface water divide, with surface flow draining to the northwest and to the southeast. A surface water drainage feature is located to the northeast of the landfill. This feature drains to the northwest, to a perennial, unnamed stream. Surface water sample location SW-1 is located in this unnamed stream, north of the landfill. The unnamed stream drains to the west, to the Catawba River. Surface water sample location SW-2 is located in this unnamed stream, west of the landfill. A second surface water drainage feature is located the southwest of the landfill, draining to the northwest into the unnamed stream.

The monitoring system at the landfill consists of eleven groundwater monitoring wells and two surface water sample locations, as listed below.

Monitoring Wells:	MW-5
	MW-5A
	MW-6
	MW-6A
	MW-7
	MW-7A
	MW-8
	MW-8A
	MW-9
	MW-9A
	MW-10A
Surface Water	SW-1
Sample Locations	SW-2

The locations of the wells and the surface water sample locations are shown on Figure 1.

With the exception of well MW-10A, the wells are installed as well pairs with one shallow well and one deeper well adjacent to each other. The well with the "A" designation is the deepest of the pair of wells. Well pair MW-9 and MW-9A are installed adjacent to and downgradient from the Leachate Collection Basin. The remaining wells are installed adjacent to the landfill.

2.0 SCOPE OF WORK

To complete the scope of work, S&ME completed the following tasks:

- Received field sampling information provided by Duke (performed by Duke) for monitoring wells MW-5, MW-5A, MW-6, MW-6A, MW-7, MW-7A, MW-8, MW-8A, MW-9, MW-9A, and MW-10A. Surface water sample locations SW-1, and SW-2 were also sampled. A leachate sample was collected at the outfall of the pipe conveying leachate from the landfill to the Leachate Collection Basin. All samples were collected on December 7, 2009.
- Reviewed the laboratory analytical results for samples. These results were provided in both a paper format and in an EXCEL file. The EXCEL file was manipulated to conform to the format requirements of the NCDENR Electronic Data Deliverable template.
- Developed a groundwater flow contour map using map data and groundwater elevation data supplied by Duke.
- Provided a preliminary evaluation of the cause and significance of values exceeding the NC 2L groundwater standards.
- Prepared and submitted this Semi-Annual Groundwater Monitoring Report to Duke and to NCDENR.

3.0 RESULTS

3.1 Site Groundwater Flow

Groundwater flow contours for the site are shown on **Figure 2.** These contours were developed using the groundwater elevations measured on December 7, 2009.

Cashion Road is located along a surface water divide at elevations ranging from approximately 748 feet to 740 feet. The unnamed stream where surface water sample locations SW-1 and SW-2 are located ranges in elevation from approximately 691 feet near SW-1 to approximately 650 feet near SW-2.

Groundwater flow beneath the landfill is generally from the south end of the landfill towards the surface water drainage features described above. Groundwater flow on the east side of the landfill is towards the surface water drainage feature located to the northeast of MW-6, MW-6A, and MW-10A.

3.2 Analytical Results

Water samples were collected from the following locations:

Monitoring Wells:	MW-5A, MW-6, MW-6A MW-7A, MW-8, MW-8A MW-9, MW-9A MW-10A
Surface Water Sample Locations	SW-1, SW-2
Leachate	Outlet end of pipe conveying leachate from the landfill into the Leachate Collection Basin

Groundwater samples could not be collected from monitoring wells MW-5 and MW-7 due to an insufficient volume of water in these wells.

Samples were analyzed for the compounds listed in the *McGuire Nuclear Station Landfill #2 Permit Number 60-04 Groundwater Monitoring Program Sampling and Analysis Plan, February 24, 2009*. A summary of the field data is presented in **Table 1.** The results of the laboratory analyses for non-radiological samples are summarized in **Table 2.**

Results from the monitoring wells met the corresponding NCAC 2L groundwater quality standards[1] with the exceptions noted below:

- pH – pH values equal to or below 6.5 were measured wells MW-5A, MW-6, MW-6A, MW-7, MW-9, MW-9A, MW-10A and at SW-1. The measured pH values below 6.5 ranged from 5.6 (Standard Units) in MW-6A to 6.5 in MW-9A.

  The pH values measured at these locations are consistent with historic readings at the site.

TPH-DRO compounds were detected in monitoring well MW-10A at a concentration of 0.17 µg/L. No 2L standards are established for TPH-DRO compounds.

Chloromethane was detected in monitoring well MW-8 at a concentration equal to the SWSL of 1.0 µg/L. No additional compounds were measured at concentrations that meet or exceed the SWSL's.

Table 3 presents the results of analysis for radiological constituents. These results were provided by Duke Energy. A copy of this report is submitted to the NCDENR Radiation Protection Section.

[1] Groundwater sampling at this site occurred prior to the 15 A NCAC 02L .0202 Groundwater Quality Standards revision date of January 1, 2010. Therefore the analytical results were compared to the Groundwater Standards in effect at the time of sampling.