S&ME

October 4, 2010

North Carolina Department of Environment and Natural Resources (NCDENR)
Division of Waste Management – Solid Waste Section
610 East Center Avenue
Mooresville, North Carolina 28115

RECEIVED NCDENR
OCT -5 2010
SOLID WASTE SECTION

Attention: Charles T. Gerstell
Environmental Senior Specialist, Regional Representative

Reference: **September 1, 2010 NCDENR Facility Compliance Audit Report**
Lincoln County Landfill (Permit No. 55-03)
Crouse, North Carolina
S&ME Project No. 1356-03-255B

Dear Mr. Gerstell:

S&ME, Inc. (S&ME), on behalf of Lincoln County, is responding to the referenced facility compliance audit report regarding methane concentrations at the Lincoln County Landfill. As per the audit, S&ME is aware that Lincoln County is in violation of 15A NCAC 13B .1626(4)(a)(ii) and .1626(4)(c) regarding methane concentrations above the regulatory threshold at the property boundary and the reporting of those concentrations.

As a consequence of the violations, S&ME understands that Lincoln County is required to submit a remediation plan within 30 days of receipt of the audit report. The remediation plan should describe the nature and extent of the methane gas release and proposed remedy. The following sections of this letter will address the methane gas violations, describe the nature and extent of the methane gas, and propose a corrective remedy.

Notice of Violations

The following discusses the findings of the facility audit and the violations in regards to methane gas migration at the facility.

15A NCAC 13B .1626(4)(a)(ii)
As per the audit, S&ME is aware that NCDENR reviewed the facility's methane monitoring records which indicated that two methane monitoring wells at the property boundary had recent and historical concentrations of methane gas above the lower explosive limit (LEL) of 5 percent methane. Because owners and operators of municipal solid waste landfill (MSWLF) units are required to maintain methane concentrations below the LEL at the property boundary, NCDENR issued a notice of violation.

The two methane monitoring wells with concentrations above the LEL are MMW-6 and MMW-7. S&ME has included with this letter Figure 1, Methane Monitoring Well Locations and Table 1, Methane Gas Measurements for reference. Please note that MMW-6 and MMW-7 are located west and southwest of the closed, unlined landfill identified as Area "E". Historical methane concentrations for these wells will be discussed in further detail in the "Nature and Extent" section of this letter.

15A NCAC 13B .1626(4)(c)

As per the audit, S&ME is aware that NCDENR also issued a notice of violation because Lincoln County did not notify the NCDENR when methane concentrations above the LEL at the property boundary where identified. Furthermore, Lincoln County did not take steps to prepare a remediation plan or address the issue.

Nature and Extent of Methane Gas

The methane monitoring wells with concentrations above LEL are identified as MMW-6 and MMW-7, and as previously stated, are located to the west and southwest of the closed, unlined landfill identified as Area "E". S&ME has obtained historical methane concentrations from Lincoln County for the period of February 2008 to August 2010 and has prepared Table 1, Methane Gas Measurements, for reference.

Based on the historical methane concentrations, S&ME is aware that MMW-7 has only recently had a measured concentration of methane above LEL during the February 2010 quarterly monitoring event and has had decreasing measurements from 2% to 0% since then. It appears that methane concentrations in MMW-7 spiked in February 2010 at a concentration of 8.4% and have since decreased to non-detect. S&ME is also aware that MMW-6 started having measured concentrations of methane in April 2009 and fluctuated between concentrations below the LEL and non-detect until February 2010 when concentrations exceeded the LEL and have remained elevated since.

The methane gas concentrations measured in MMW-6 and MMW-7 are most likely from the adjacent unlined landfill identified as Area "E". Area "E" encompasses approximately 13 acres and began landfilling activities in early 1988 and continued operations until October 1993 when the lined MSW landfill identified as Area "D" (Phase I) began operation. Area "E" is currently closed with a 24-inch thick soil cover.

Area "E" is bound on the west by an unnamed tributary to Indian Creek which acts as a natural hydraulic barrier to methane gas migration off property. The unnamed tributary is a groundwater discharge point and flow begins north of MMW-7. MMW-6 and MMW-7 are located in between Area "E" and the unnamed tributary as illustrated on Figure 1. Gas migration off the property towards the west from Area "E" is unlikely due to the unnamed tributary acting as a hydraulic barrier along the western property line.

Because the unnamed tributary to the west of Area "E" is a natural hydraulic barrier, it is unlikely that methane is migrating off property toward the west. Also, based on historical monitoring data provided by Lincoln County, methane gas has not been detected within the facility's buildings and structures.

Proposed Corrective Remedy

To address the notice of violations concerning methane gas, S&ME proposes the following.

Methane Monitoring and Reporting
Lincoln County will continue to monitor methane gas concentrations at the facility on a quarterly basis. However, S&ME will report each monitoring event directly to the NCDENR using the appropriate Environmental Monitoring Report Form sealed by a North Carolina registered geologist. Each quarterly report will provide methane concentrations measured by Lincoln County personnel, it will also provide a notice of methane exceedances (if any) and proposed corrective actions if required.

Also, Lincoln County is in the process of installing methane gas detectors within the facility's shop building and scale house which will provide continuous methane monitoring and alarms if methane concentrations exceed the LEL.

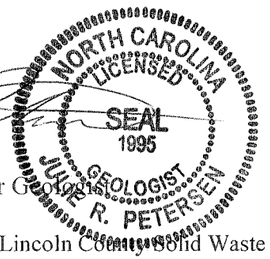
Area "E"
Because methane concentrations above LEL currently appear to be concentrated in the area of MMW-6 and MMW-7 and because the unnamed tributary bounds the property on the west, S&ME believes that the potential for methane migration in excess of the LEL off the property is low and is not proposing corrective measures at this time. However, Lincoln County, in an effort to reduce surface water migration through the soil cover of Area "E" thus reducing the potential for methane production, will visually observe the soil cover and repair any areas that appear depressed or may not be positively draining. The County will also visually observe the stormwater conveyance structures for Area "E" and make any necessary repairs.

In the future, if methane concentrations are detected above the LEL at the property boundary in areas where there is a potential for migration off property or methane appears to be migrating into the facility's buildings and structures posing a threat to human health, S&ME will notify the NCDENR and provide a corrective action plan within 30 days.

Closing

Please be aware that Lincoln County considers the protection of human health and the environment to be of paramount concern. Lincoln County is committed to providing the resources necessary to address NCDENR's concerns at the Lincoln County Landfill and intends to work closely with NCDENR to address these issues. Please call us at (704) 523-4726 if you have any questions or comments, or if we can be of further assistance.

Sincerely,
S&ME, Inc.



Julie R. Petersen, P.G.
Project Manager/Senior Geologist

Ken Daly, P.E.
Senior Project Engineer

cc: Nancy Rickard - Lincoln County Solid Waste Manager
Burns Whitaker, P.E. - Lincoln County Public Works Director
Jackie Drummond - NCDENR Division of Waste Management, Solid Waste Section

Table 1 - Methane Gas Measurements

Data Tracking for the Years of 2008 to 2010
Lincoln County Landfill (Permit #55-03)

S&ME

Percent Methane Gas by Date

Date	Well Identification								Monitored Structure		
	MMW-1	MMW-2	MMW-3	MMW-4	MMW-5	MMW-6	MMW-7	MMW-8	Scale House	Shop Area	Lift Station
Feb-08	0	0	0	0	0	0	0	**0.006**	0	0	N/A
Apr-08	0	0	0	0	0	0	0	0	0	0	N/A
Sep-08	0	0	0	0	0	0	0	**0.7**	0	0	N/A
Feb-09	0	0	0	0	0	0	0	**2.5**	0	0	0
Apr-09	0	0	0	0	0	**4.3**	0	0	0	0	0
Jul-09	0	0	0	0	0	**2.1**	0	0	0	0	0
Nov-09	0	0	0	0	0	0	0	**1.5**	0	0	0
Feb-10	0	0	0	0	0	**18.4**	**8.4**	0	0	0	0
Jun-10	0	0	0	0	0	**14.8**	**2**	**2.3**	0	0	0
Aug-10	0	0	0	0	0	**23**	0	**0.03**	0	0	0

Notes:
(1) Recorded measurements are in percent methane.
(2) Highlighted data are above 100 percent of the lower explosive limit.
(3) Lower explosive limit for methane is 5 percent.
(4) Upper explosive limit for methane is 15 percent.
(5) N/A = Not Available
(6) Methane measurements collected by Lincoln County personnel.
(7) Lift Station monitoring was added in January 2009.

REFERENCE:
AERIAL PHOTOGRAPHY PERFORMED BY SPATIALDATA CONSULTANTS INC. ON 07-04-10. HORIZONTAL DATUM NAVD83, VERTICAL DATUM NAVD88.

SCALE: 1" = 400'
PROJECT NO. 1356-03-255B
DATE: 10-4-10
DRAWN BY: CLD
CHECKED BY:

S&ME
WWW.SMEINC.COM

METHANE MONTORING LOCATIONS

LINCOLN COUNTY LANDFILL
CROUSE, NORTH CAROLINA

FIGURE NO.
1