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November 30, 2012

Jaclyne Drummond
Compliance Hydrogeologist
Solid Waste Section
Division of Waste Management
1646 Mail Service Center
Raleigh, NC 27699-1646

Re: **Gas Assessment Plan**
Town of Kernersville Landfill (#34-04)
Forsyth County, NC



Dear Ms. Drummond:

This letter serves as a Gas Assessment Plan for the Town of Kernersville Landfill (Permit #34-04) and is provided in response to your request for the plan, dated November 1, 2012. The reason for requesting the Gas Assessment Plan was the results of soil gas testing conducted on September 26, 2012 using the five recently installed gas probes at the landfill. Additional background information and the proposed Gas Assessment Plan are provided below.

BACKGROUND INFORMATION

The Town of Kernersville Landfill is a closed, unlined municipal solid waste (MSW) landfill located on approximately 58.2 acres in Forsyth and Guilford Counties, North Carolina, approximately 10 miles north of the City of Kernersville. The waste disposal area comprises approximately 13.8 acres. The facility was issued a Permit to Operate on May 15, 1985 and a letter of closure was issued on December 10, 1991.

The area surrounding the landfill is zoned residential/agricultural and contains open fields and woodlands. The landfill is separated to the North from the Waste Management Piedmont Landfill and Recycling Center Facility by Freeman Road. The landfill is bounded to the south by an unnamed tributary of Belews Creek.

Gas monitoring probes were recently installed at the Kernersville Landfill as required by the North Carolina Department of Environment and Natural Resources (NC DENR). Probe locations are shown on Drawing No. 1. The first landfill gas monitoring event utilizing the new probes took place on September 26, 2012, after which a report of the findings was submitted to NC DENR.

The landfill gas monitoring event revealed landfill gas (methane) concentrations that exceeded the lower explosive limit (LEL) in the three probes on the north boundary of the facility (Probes GW-1, GW-2 and GW-3) where the LEL results were 524%, 1028% and 254% respectively.

Results at the two other on-site probes were 28% LEL in probe GW-4 and 0% LEL in probe GW-5.

As presented above, the Kernersville Landfill is just south of and across Freeman Road from the closed Waste Management Piedmont Landfill. Landfill gas monitoring is performed at the Piedmont Landfill as well. All methane results from the Piedmont Landfill gas probes are 0% LEL, with the exception of probe GP-10, which is located approximately 100 feet northwest of Kernersville probe GW-2. In the most recent monitoring event at the Piedmont Landfill, the result at probe GP-10 was 640% of the LEL. In their reporting to NC DENR, Waste Management contended that the gas in GP-10 was likely attributable to the Kernersville Landfill. The Piedmont Landfill is lined, reducing the likelihood of gas migration, plus, GP-10 is the only gas probe with methane present. In response to findings from the Piedmont gas testing and their own gas testing, Kernersville has agreed to further assess gas migration from the Kernersville Landfill.

GAS ASSESSMENT PLAN

Kernersville will initiate a gas assessment program. As requested by NC DENR, Kernersville initiated monthly gas monitoring in November 2012. Results are presented on the gas monitoring forms, attached. In addition, Kernersville will make an effort to further delineate the extent of methane migration. The existing gas monitoring probes at the Kernersville site and on the Piedmont property generally serve to delineate the extent of gas migration, however, additional delineation efforts are warranted. Probe GW-4 generally delineates the eastern extent of migration. Probe GW-5 identifies the limit of gas migration above the LEL to the west of the landfill. Surface water, likely representative of the water table intersecting the ground surface, limits gas migration to the south of the landfill. Piedmont Landfill probe GP-11 indicates the limits of migration to the west on the north side of the Kernersville landfill and probe GP-9 indicates the limits of migration to the northeast on Piedmont Landfill property. The general known extent of migration is shown on Drawing No. 1.

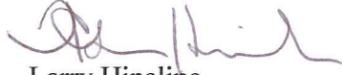
Kernersville is proposing three new temporary gas probes to better delineate the extent of gas migration. Probe locations are shown on Drawing No. 1. GW-6 is proposed to the northeast of the landfill to assess migration in that direction. GW-7 is proposed between Piedmont probes GP-9 and GP-10 to better define the limits of migration between those two locations. GW-8 is proposed to the north of Piedmont probe GP-10, the one probe on Piedmont property that shows impact by gas. There is limited area north of GP-10 to install a gas probe to assess migration to the north, as the liner and cap for the landfill are immediately north of Freeman Road. The installation of probes GW-7 and GW-8 is contingent upon Waste Management approval to install a probe at that location. JOYCE has contacted Waste Management, but is presently awaiting a response. If proposed probe GW-8 indicates the presence of gas, no further delineation to the north will be possible due to the presence of the Piedmont Landfill refuse and cap immediately north of the perimeter road where GW-8 is being installed.

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This assessment plan includes a contingency to install one additional temporary probe based on the findings of the first three proposed probes.

Temporary probes will be installed to a depth of approximately 20 feet and will be constructed of 1-inch PVC with a screen extending from 20 feet to 5 feet below grade.

Upon completion of installation and initial monitoring of the existing and proposed gas probes, JOYCE will submit a report to NC DENR with findings and recommendations for further monitoring or other response actions, if warranted. Monthly monitoring of the existing and proposed probes will continue until an alternative program is recommended by JOYCE and approved by NCDENR. Temporary probes will be removed or completed depending on results.

Sincerely,
JOYCE ENGINEERING, INC.

Larry Hine
Technical Consultant

Cc: Thad Buck, Kernersville, NC

Landfill Gas Monitoring Data Form

Facility Name: Town of Kernersville
 Date of Sampling: September 26, 2012
 Gas Monitor Type & Serial Number: GEM 2000; GM05194
 Field Calibration Date & Time: 9/26/2012 9:00
 General Weather Conditions: Sunny, 73°F

Permit Number: 34-04
 Personnel: Robert Winfield
 Calibration Date: August 17, 2012
 Calibration Gas Type: 50% CH4, exp. 2-2014
 Barometer : 30.19 In-Hg

Location or ID	Time	Probe Pressure (In Wg)	Instr. sample tube purged	Time Pumped (sec.)	Initial %LEL	Stabilized %LEL	CH ₄ (%Vol)	Notes
GW-1	13:53	0.270	Y	60	524	524	26.2	
GW-2	13:57	0.360	Y	60	1028	1028	51.4	
GW-3	14:00	0.050	Y	60	254	254	12.7	
GW-4	14:04	0.000	Y	60	0	0	0	
GW-5	13:05	0.00	Y	60	28	28	1.4	

Landfill Gas Monitoring Data Form

Facility Name: Town of Kernersville
 Date of Sampling: November 9, 2012
 Gas Monitor Type & Serial Number: GEM 2000; GM05194
 Field Calibration Date & Time: 11/9/2012 8:00
 General Weather Conditions: Sunny, 60's°F

Permit Number: 34-04
 Personnel: Robert Winfield
 Calibration Date: August 17, 2012
 Calibration Gas Type: 50% CH4, exp. 2-2014
 Barometer : 30.22 In-Hg

Location or ID	Time	Probe Pressure (In Wg)	Instr. sample tube purged	Time Pumped (sec.)	Initial %LEL	Stabilized %LEL	CH ₄ (%Vol)	Notes
GW-1	14:10	0.20	Y	60	856	856	42.8	
GW-2	14:03	0.11	Y	60	694	694	34.7	
GW-3	13:36	0.00	Y	60	72	72	3.6	
GW-4	14:26	0.00	Y	60	0	0	0	
GW-5	13:49	0.00	Y	60	0	0	0	

