McGill ASSOCIATES

February 24, 2014

Ms. Elizabeth S. Werner
Solid Waste Section – Permitting Branch Hydrogeologist
North Carolina Department of Environment and Natural Resources
Raleigh Regional Office
1601 Mail Service Center
Raleigh, North Carolina 27699-1646

RE: Report of Findings of LFG Assessment
August 2010 through December 2013
Francis Farm Landfill, Permit Number 44-03
Haywood County, North Carolina

Dear Ms. Werner:

On behalf of Haywood County, McGill Associates is pleased to present to you this Report of Findings of Landfill Gas Assessment for the period August 2010 through December 2013 for the Francis Farm Landfill (FFLF) in Haywood County. The Report of Landfill Gas Assessment presented to you in November 2011 outlined a process of continued landfill (LFG) monitoring at the FFLF in order to evaluate the effectiveness of the Gas Collection, Combustion, and Electrical Generation System (GCCS) in controlling the migration of LFG. The flare station was brought on line in February 2012 and the electrical generation system became operational later in 2012. The flare and generator were down periodically for troubleshooting during the first few months of operation; therefore, the County extended the study period to get a better understanding of the relationship between the flare/generator operations and LFG migration. This Report includes the assessment monitoring results for the period August 2010 through December 2013 and provides trend data for each of the 13 LFG monitoring wells where methane gas observations were conducted. Also included in this Report is a description of the ongoing efforts by the County to improve the landfill cap and increase the efficiency of the GCCS. The County will continue monthly LFG monitoring as described in Section 5 of the Report. Please find enclosed a hard copy and a digital copy of the Report for your review.

Trend data for the LFG monitoring wells at the southern and northeastern margins of the FFLF show a close correlation between the operation of the flare/generator system and the migration of LFG. Methane gas monitoring results at LFG monitoring well MM-10 in particular appear to suggest a direct influence between the operation of the flare/generator system and the migration of LFG. At the northern and western margins of the FFLF, it does not appear that the GCCS has as much of an influence on the migration of LFG, perhaps in part because the County is unable to apply as much vacuum on the GCCS in these areas due to the infiltration of oxygen into the system. We are optimistic that implementing the proposed improvements to the landfill

cap as outlined in Section 4 of the Report will enable the County to increase the vacuum of the GCCS at the northern and western portions of the landfill and in the process decrease the migration of LFG from the periphery of the landfill.

The County is continuing to work to solve the problem of LFG migration at the Francis Farm Landfill. Concurrent with the Landfill Gas Assessment, the County is conducting an assessment monitoring program for groundwater, in accordance with Section 15A NCAC 13B.1634 of the Solid Waste Rules. As part of the groundwater assessment, the County is working towards beginning the Assessment of Corrective Measures (ACM) phase of the project, in accordance with Section 15A NCAC 13B.1635 of the Solid Waste Rules. As part of the ACM, the County will review additional measures to control landfill gas migration. In the interim, the County will continue to improve the operation of the GCCS and continue monthly monitoring of the landfill gas monitoring wells.

We look forward to working with you during your review of the Report of Findings of Landfill Gas Assessment as Haywood County works aggressively to control LFG migration at the Francis Farm Landfill. Please let us know if you have any questions or require additional information regarding this Report of Findings.

Sincerely,
McGILL ASSOCIATES, P.A.

DAVE PASKO
Senior Engineering Technician

Enclosures

cc: Ira Dove, Haywood County Manager, w/enc
David Francis, Haywood County Tax Assessor, w/enc
Stephen King, Haywood County Solid Waste Director, w/enc
Allen Gaither, NCDENR Solid Waste Section, w/enc
Andrea Keller, NCDENR Solid Waste Section, w/enc
Randall Siske, Haywood County, w/enc
Andy Alexander, BLE, w/enc
Mark Cathey, McGill Associates, w/enc

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REPORT OF FINDINGS
LANDFILL GAS ASSESSMENT
AUGUST 2010 THROUGH DECEMBER 2013

FRANCIS FARM LANDFILL
PERMIT NO. 44-03
HAYWOOD COUNTY, NORTH CAROLINA

MARK D. CATHEY, PE

McGill ASSOCIATES
Engineering • Planning • Finance
Asheville, North Carolina

February 2014

12.00732/10.00726

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Report of Findings
Landfill Gas Assessment
August 2010 through December 2013
Francis Farm Landfill
Permit No. 44-03

Table of Contents

1.0 Project History

The Francis Farm Landfill, Permit No. 44-03, is located in Haywood County, North Carolina on Francis Farm Road, (S.R. 1802), near Waynesville, North Carolina and was the County's primary MSW landfill from its opening in the early 1970's through 1994. The facility was officially closed per a Closure Certification prepared by RCF, Inc. Hazelwood, North Carolina dated September 14, 1994 and submitted to the North Carolina Department of Environment and Natural Resources (NCDENR). The original Permit for Closure was issued on December 13, 1995. The facility encompasses approximately 33.1 acres as shown on the LFG Monitoring Site Plan, included as Figure 1. Within the Facility Boundary, in addition to the closed landfill, Haywood County Schools (HCS) operates a maintenance/ bus garage facility. The maintenance facility includes the Maintenance (bus garage) Building, an equipment storage building, and a maintenance storage building. The Maintenance Building consists of offices, carpentry shop and bus maintenance facility. Additionally, the HCS parks school buses at the southern periphery of the property during summer months. The facility property is bounded by private property utilized for residential and agricultural uses. The closest residential structure is located on the Stephens property, approximately 340 feet to the south of the facility property line.

The North Carolina Department of Environment and Natural Resources (NCDENR), Solid Waste Section (SWS) performed a Facility Compliance Audit Report on July 21, 2010, in which the SWS required that Haywood County prepare and submit a Landfill Gas Assessment and Remediation Plan for the Francis Farm Landfill. The Plan was submitted to the NCDENR on September 13, 2010. Haywood County enlisted the services of McGill Associates, P.A. to carry out the monitoring requirements specified in the Plan and to coordinate implementation of the remediation measures included in the Plan. A Report of Landfill Gas Assessment was submitted to the NCDENR-SWS on November 15, 2011. The Report summarized the findings of the assessment monitoring period and described the remediation measures undertaken by Haywood County to control landfill gas (LFG) migration at the Francis Farm Landfill. The primary measure to control LFG migration was the installation of a gas collection, combustion, and electrical generation system (GCCS). In the Report of Landfill Gas Assessment, the County proposed an additional year of LFG assessment once the GCCS project was completed and the flare station began operation. The County constructed the GCCS and completed a month-long start-up period for the flare station on February 15, 2012, and began flaring operations prior to the generator coming on-line later in the year. This Report of Findings evaluates LFG monitoring results for the period of August 2010 through December 2013, which includes the time period prior to and after the start-up of the flare station. Also included in this Report are additional options available to the County for increasing the efficiency of the GCCS in order to better control LFG migration and a plan for continued LFG monitoring.

Concurrent with the Landfill Gas Assessment, the County is conducting an assessment monitoring program for groundwater at the Francis Farm Landfill, in accordance with Section 15A NCAC 13B.1634 of the Solid Waste Rules. As part of the groundwater assessment, the County is working towards beginning an Assessment of Corrective Measures (ACM) phase of the project, in accordance with Section 15A NCAC 13B.1635 of the Solid Waste Rules. As part of the ACM, the County will review measures to control landfill gas migration and groundwater

issues in great detail. In the interim, the County will continue to improve the operation of the GCCS and continue monthly monitoring of the landfill gas monitoring wells.

2.0 Gas Collection and Combustion System

The Gas Collection and Combustion and Energy Generation System (GCCS) was installed at the Francis Farm Landfill in late 2011 and early 2012. The County began to operate the flare system on February 15, 2012, while the work on the electrical generation system was being finalized. In the months after the flare start-up, the County went through the anticipated period of becoming familiar with the well field, learning where and how to operate the valves that would control the flow of gas, and systematically repairing the inevitable leaks in the wellheads. During this period, the flare was shut down periodically if oxygen levels were too high in order to locate the source of the oxygen inflow and repair as necessary. County Staff has learned that there is a fine balance in the amount of vacuum that can be applied to in the gas collection system before oxygen enters the system.

The electrical generating system was connected to the grid in June 2012. The County is currently running the generator as much as possible, and then during periods of generator shutdown, the flare system operates solely. The GCCS has provided 259,150 kWhr to the electrical grid since the start-up of the generator through December 31, 2013.

An important facet of the GCCS is the operation of dewatering pumps within the gas extraction wells. The County installed 6 pumps during the initial construction of the project and began to pump leachate to the Waynesville Wastewater Treatment Facility in mid-December 2011. Since that time through the end of December 2013, the County has discharged 1,094,000 gallons to the Treatment Facility. In 2012, the County added 6 additional dewatering pumps to remove leachate and can now pump from 12 locations within the gas extraction well field.

3.0 Landfill Gas Monitoring Results

The Landfill Gas Assessment and Remediation Plan outlined a detailed approach to monitor LFG migration at the Francis Farm Landfill. At the beginning of the assessment period in August 2010, an informed evaluation of LFG migration at the Francis Farm Landfill was difficult because of the lack of available data. Haywood County began LFG monitoring in accordance with the Report of Landfill Gas Assessment at the locations listed in Table 1 in August 2010 and has continued monthly monitoring through the current time. The baseline of information for the period before the flare start-up on February 15, 2012 can be compared to the monitoring results observed since that time. This report evaluates the entire time period from August 2010 through December 2013 to determine the impact of the GCCS on landfill gas migration. LFG monitoring observations were not conducted in January 2012.

Table 1 –Landfill Gas Monitoring Locations

LFG Monitoring Number	Location Description
MM-1	LFG Monitoring Well along northern property line
MM-2	LFG Monitoring Well along northern property line
MM-3	LFG Monitoring Well along northern property line
MM-4	LFG Monitoring Well along northern property line
MM-5	LFG Monitoring Well along northern property line
MM-6	LFG Monitoring Well along northeastern property corner
MM-7	LFG Monitoring Well along eastern property line
MM-8	LFG Monitoring Well along eastern property line
MM-9	LFG Monitoring Well along southern property line
MM-10	LFG Monitoring Well along southern property line
MM-11	LFG Monitoring Well along southwestern property line
MM-12	LFG Monitoring Well along western property line
MM-13	LFG Monitoring Well along western property line
SM-1a	Monitoring Point in Maintenance/ Bus Garage Building – Bus Garage (base of mezzanine stairs)
SM-1b	Monitoring Point in Maintenance/ Bus Garage Building – Office Area (main hallway)
SM-1c	Monitoring Point in Maintenance/ Bus Garage Building - Carpentry Shop
SM-2	Equipment Storage Building (doorway between garage and storage area)
SM-3	Maintenance Storage Building (middle storage bay at floor drain)
MW-12	Groundwater Monitoring Well, located off of Landfill Property at the South end of the Site. Located near MM-9.

See Appendix 2 for the monthly methane monitoring results observed during the period from August 2010 through December 2013. A summary of the results is included in Appendix 1. Methane gas was not detected in any of the on-site structures during the assessment monitoring period. Prior to the start-up of the flare system, methane gas was observed in excess of the 100% LEL level on a regular basis at the following LFG monitoring wells: MM-1, 2, 3, 4, 6, 10, 11, and 12. Since the flare start-up, methane gas levels at MM-10 have dropped to within the compliance limits required by the NCDENR. Methane gas was not detected at the LFG

monitoring wells on the east, southeast, and northwest sides of the landfill. See Figure 1 for a map that illustrates the location of the LFG monitoring wells.

Results from the assessment monitoring period showed that LFG migration was significantly reduced at 4 monitoring wells, MM's 10 and 11 at the southwestern corner of the landfill and MM's 4 and 6, at the northeastern margin of the landfill. LFG monitoring wells along the northern property line - MM's 1, 2, and 3, and MM-12, at the western margin of the landfill appear to have not been impacted by the operation of the flare/generator system. LFG MM-10 showed the most dramatic response to the operation of the flare/generator system, with an almost immediate drop in methane concentrations when the gas collection system began operating. Results outside of compliance limits were occurring at the northern and southwestern margins of the landfill. The County has continued to monitor the LFG wells since the flare start-up in February 2012.

Statistical analysis of the results of the methane monitoring is included in Appendix 3. Trend lines for methane observations are shown for each location where the 100% LEL limit was regularly exceeded. Microsoft Excel software was used to create the trend lines shown on the graphs.

4.0 Proposed Recommendations for Improvements to the GCCS

The County's procedures for operating the GCCS are under constant review in order to maximize the efficiency of the system and to minimize or eliminate methane gas migration from the site. The GCCS has had a positive impact on the migration of methane gas at the Francis Farm Landfill; however, there are areas within the landfill that the system is not working as efficiently as planned. These areas are in the vicinity of extraction well (EW) - 16 and the EW's north of the access road to the site (EW's 17-21). The following steps are being taken by the County to improve the efficiency of LFG collection in these areas.

4.1 Improving Landfill Cap in the Vicinity of EW – 16

EW-16 is the deepest extraction well at the site and was installed to a depth near the bottom of the landfill cell that was developed in the early 1980's. When the cell was constructed, a drainage pipe was used in the early stages of operations in order to facilitate the bypass of stormwater around the waste mass. As the waste fill increased in the area, the drainage pipe was plugged and abandoned on the landfill side of the pipe; however, the pipe is unplugged on the downstream end and still allows the atmosphere to reach beneath the landfill. The County has learned that if the valve at EW - 16 is opened up more than 1 turn, then within 24 hours, oxygen enters the GCCS, creating problems at the blower. EW - 16 should be the best methane producer of all of the extraction wells at the Francis Farm Landfill. The County has entered into a contract with a construction firm to plug the downstream end of the existing drainage pipe in order to minimize oxygen infiltration into the waste mass near EW – 16. It is hoped that the valve for EW – 16 can be fully opened and that this extraction well will be an excellent source of methane

gas in the GCCS, and in the process, decrease the flow of LFG at the compliance monitoring wells.

4.2 Improving the Landfill Cap

As part of Haywood County's ongoing efforts to maintain and improve the landfill cap, the County is under contract with a grading contractor to perform improvements to the existing landfill cap to improve runoff from the cap and help minimize oxygen infiltration. Fill dirt will be added to aid drainage at the drainage terraces that have subsided over time and additional drainage pipes will be installed. It is anticipated that the planned improvements will minimize the infiltration of runoff into the waste mass and that the GCCS will operate more efficiently while decreasing the amount of leachate generated at the landfill.

4.3 Installation of Additional Landfill Gas Extraction Wells

The County is assessing all viable options for improving the efficiency of the gas collection and combustion system. An option under consideration is to install additional extraction wells. With bugs still being worked out in the existing extraction well field, particularly in the vicinity of EW-16 as described in Section 4.1, it would be prudent to not add additional variables into the operation of the well field at this time. The County will consider the addition of new extraction wells at the time of preparation of the ACM.

5.0 Proposed Recommendations for Continued Landfill Gas Monitoring

The County currently monitors the 13 LFG monitoring wells, on-site structures, and groundwater monitoring well MW-12 on a monthly basis. The County proposes continuing monitoring the existing LFG locations on a monthly basis, except for groundwater monitoring well MW-12, which the County would like to remove from the LFG monitoring network. MW-12 has consistently shown methane concentrations at 0%. In addition, MM-9 is located at the County's compliance boundary just a few feet away and also has consistent readings at 0% methane.

The proposed methane monitoring locations are noted in Table 3 below. The County proposes to continue monthly monitoring at these locations.

Table 3 – Proposed Methane Gas Monitoring Locations

Compliance Point	Description
MM-1	LFG Monitoring Well along northern property line
MM-2	LFG Monitoring Well along northern property line
MM-3	LFG Monitoring Well along northern property line
MM-4	LFG Monitoring Well along northern property line
MM-5	LFG Monitoring Well along northern property line
MM-6	LFG Monitoring Well along eastern property line
MM-7	LFG Monitoring Well along eastern property line
MM-8	LFG Monitoring Well along eastern property line
MM-9	LFG Monitoring Well along southern property line
MM-10	LFG Monitoring Well along southern property line
MM-11	LFG Monitoring Well along western property line
MM-12	LFG Monitoring Well along western property line
MM-13	LFG Monitoring Well along western property line
SM-1a	Monitoring Point in Maintenance Building – Bus Garage (at top of mezzanine stairs)
SM-1b	Monitoring Point in Maintenance Building – Office Area (main hallway)
SM-1c	Monitoring Point in Maintenance Building - Carpentry Shop (at top of mezzanine stairs)
SM-2	Equipment Storage Building - (doorway between garage and storage area)
SM-3	Maintenance Storage Building (middle storage bay at floor drain)

FIGURES

Note:
Figure 1 at end of this file

FIGURE 1

Francis Farm Landfill
LFG Monitoring Site Plan

APPENDICES

APPENDIX 1

Summary of Landfill Gas Monitoring Observations

Report of Findings
Landfill Gas Assessment
August 2010 through December 2013

Francis Farm Landfill
Permit #44-03
Haywood County, North Carolina

January 2014

Methane Monitoring Summary

Well or Pobe ID	Aug '10	Sep '10	Nov '10	Dec '10	Jan '11	Feb '11	Mar '11	Apr '11	May '11	Jun '11	Jul '11	Aug '11	Sep'11	Dec'11	Feb'12	Mar'12	Apr'12	May'12
MM-1			38.5	29.8	48.4	43.0	0.0	0.5	63.5	30.7	64.1	53.2	63.4	26.1	45.1	67.4	40.5	69.5
MM-2			42.3	50.6	50.4	49.3	69.8	55.9	61.9	56.9	55.9	58.2	61.2	61.6	51.7	64.4	64.2	63.4
MM-3	3.6	0.2	4.0	43.8	45.4	41.1	49.8	45.5	54.9	50.7	54.9	53.1	52.8	40.2	47.7	54.7	57.4	58.3
MM-4	29.6	63.6	19.0	22.1	21.0	17.6	12.6	13.0	32.2	27.2	28.8	25.4	22.3	11.2	18.9	34.1	33.9	45.1
MM-5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.9	0.0	0.0	0.0
MM-6	37.7	31.0	14.6	9.9	8.8	10.5	9.5	23.6	24.9	19.3	24.4	20.8	17.6	7.5	0.1	23.6	18.4	25.6
MM-7	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MM-8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MM-9	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MM-10		55.9	49.5		56.4	52.2	54.4	8.7	51.3	52.9	54.9	45.9	56.4	58.0	20.4	4.4	0.1	12.2
MM-11		47.3	41.9	51.5	54.0	51.1	57.7	58.6	49.9	50.5	53.8	41.5	42.9	40.7	43.7	45.2	41.8	47.9
MM-12		60.6	60.9	60.8	61.5	61.3	61.0	59.4	60.1	60.3	61.0	60.4	60.8	61.5	63.6	62.0	61.3	61.8
MM-13		0.0	0.0	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.8	2.0	0.5
SM-1a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
SM-1b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-1c	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-2	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW-12		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Well or Probe ID	June'12	July'12	Aug'12	Sep'12	Oct'12	Nov'12	Dec'12	Jan'13	Feb'13	Mar'13	Apr'13	May'13	Jun'13	Jul'13	Aug'13	Sep'13	Oct'13	Nov'13	Dec'13
MM-1	64.9	64.2	63.6	68.5	60.8	65.0	62.2	0.0	0.2	0.1	0.0	68.9	71.0	0.6	69.7	66.2	65.0	55.2	2.6
MM-2	60.0	61.7	61.6	65.5	62.4	58.6	58.3	66.7	68.0	63.2	65.7	64.6	62.7	63.5	62.1	62.0	62.1	63.6	64.8
MM-3	58.8	57.6	57.4	54.7	53.3	53.4	49.0	47.3	54.8	50.5	52.8	58.4	57.6	57.1	58.0	58.7	56.7	47.6	57.5
MM-4	39.0	30.9	30.5	26.8	28.5	22.7	21.5	9.0	7.1	7.8	20.5	26.1	42.8	23.8	47.2	49.3	37.7	25.9	11.6
MM-5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	1.1	0.0	0.0	0.0	0.1	0.0
MM-6	21.9	19.3	19.9	17.1	14.5	10.2	7.2	13.8	17.5	19.6	22.7	30.8	27.0	28.4	30.1	24.6	16.9	9.2	11.9
MM-7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MM-8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MM-9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MM-10	11.5	20.3	17.5	17.3	16.7	19.2	15.2	12.2	16.6	0.3	0.1	0.0	0.1	1.9	0.2	0.0	7.4	0.0	0.0
MM-11	45.7	42.2	40.3	38.5	38.9	39.0	36.3	40.6	50.9	39.2	46.6	47.3	51.1	52.3	48.6	48.8	44.8	41.1	42.3
MM-12	61.1	61.2	61.5	62.3	62.3	62.6	61.0	62.9	62.6	63.0	62.0	62.4	60.3	61.6	61.3	61.6	61.7	62.4	62.6
MM-13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.5	3.1	1.4	0.9	3.8	2.6	0.3	0.0	0.0	2.0
SM-1a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-1b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-1c	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SM-3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Values noted are in % Methane. 5% methane = 100% Lower Explosive Limit for Methane Gas at atmospheric conditions

APPENDIX 2

Landfill Gas Monthly Monitoring Observations

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: Jeff Bishop **Date:** August 11, 2010

Weather Conditions: 51% Humidity/ Partly Cloudy **Ambient Temp:** 88

Atmospheric Pressure: 30.03" Hg

Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #:** GM05480

Factory Calibration Date: Sept 2009 **Field Calibration 50% Methane:** August 11, 2010

Gas Readings Field Worksheet

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-3	Stable	13:48	72.0	3.6	2.5	19.1	Cap missing/ Replaced
MM-4	Stable	13:42	>100	29.6	22.7	1.9	
MM-5	Stable	13:38	0.0	0.0	1.0	19.3	
MM-6	Stable	13:35	>100	37.7	21.9	1.8	
MM-7	Stable	13:30	0.0	0.0	4.3	15.7	
MM-9	Stable	13:02	0.0	0.0	3.7	16.9	
SM-1a	Stable	13:22	0.0	0.0	0.0	20.1	
SM-1b	Stable	13:18	0.0	0.0	0.0	20.0	
SM-1c	Stable	13:14	0.0	0.0	0.0	19.9	
SM-2	Stable	13:10	0.0	0.0	0.0	19.9	
SM-3	Stable	14:05	0.0	0.0	0.0	20.4	
VB-1	Stable	13:25	>100	9.7	5.0	17.1	
MW-4	Stable	13:54	4.0	0.2	0.1	20.1	
MW-5	Stable	13:59	0.0	0.0	0.0	20.3	
Vent 1	Stable	13:24	>100	46.1	28.9	5.2	
Vent 2	Stable	13:28	0.0	0.0	0.0	20.0	Vent standpipe cracked
Vent 3	Stable						Vent has been removed

Field Observation Notes:

1. Vent 2 standpipe above ground cracked at the base. Discussed replacement of standpipe with Tracy Hargrove. His staff will replace.
2. Vent 3 had been destroyed during grading activity at Bus Maintenance Facility. Discussed replacement

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: Jeff Bishop **Date:** October 1, 2010

Weather Conditions: Sunny **Ambient Temp:** 64

Atmospheric Pressure: 27.08"

Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #:** GM05480

Factory Calibration Date: September 2009 **Field Calibration Date :** September 30, 2010

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Stable						Not Installed
MM-2	Stable						Not Installed
MM-3	Stable	14:40	4.0	0.2	0.0	21.0	Replace 1" PVC Cap
MM-4	Stable	14:29	>100	63.6	28.5	0.7	
MM-5	Stable	14:25	0.0	0.0	4.5	16.2	
MM-6	Stable	14:20	620.0	31.0	24.3	0.7	
MM-7	Stable	14:15	2.0	0.1	3.8	17.0	
MM-8	Stable	15:15	0.0	0.0	1.8	18.6	need quick connect
MM-9	Stable	13:34	0.0	0.0	3.2	17.9	
MM-10	Stable	13:26	1118.0	55.9	38.2	0.7	need quick connect
MM-11	Stable	13:10	946.0	47.3	35.4	0.8	need quick connect
MM-12	Stable	12:55	1212.0	60.6	38.9	0.6	need quick connect
MM-13	Stable	12:50	0.0	0.0	15.1	4.6	need quick connect
SM-1a	Stable	14:12	0.0	0.0	0.0	21.1	Need plastic sign
SM-1b	Stable	14:09	0.0	0.0	0.0	21.2	Need plastic sign
SM-1c	Stable	14:00	0.0	0.0	0.0	21.0	Need plastic sign
SM-2	Stable	13:55	0.0	0.0	0.0	21.1	Need plastic sign
SM-3	Stable	13:50	0.0	0.0	0.0	21.2	Need plastic sign
SM-4*	Stable	15:40	0.0	0.0	0.0	20.9	Sampled underdrain at house.
VB-1*	Stable	15:03	190.0	9.5	3.4	17.9	
MW-4*	Stable	13:45	24.0	1.2	0.7	20.5	
MW-5*	Stable	13:38	0.0	0.0	0.0	21.0	

Notes:

1. If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes, contact Haywood County Solid Waste Director immediately.
2. *To be monitored from 11/15/10 to 11/15/11. May be dropped from monitoring after assessment period is complete.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: Jeff Bishop **Date:** November 22, 2010

Weather Conditions: Partly Cloudy **Ambient Temp:** 56

Atmospheric Pressure: 27.43"

Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #:** GM11944/09

Factory Calibration Date: August 27, 2010 **Field Calibration Date :** September 30, 2010

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Stable	13:20	770.0	38.5	26.3	1.0	Need lock/ 1" cap with coupler
MM-2	Stable	13:28	846.0	42.3	25.0	0.2	Need lock/ 1" cap with coupler
MM-3	Stable	13:36	80.0	4.0	23.1	0.8	
MM-4	Stable	13:42	380.0	19.0	21.7	5.3	
MM-5	Stable	13:48	0.0	0.0	3.4	18.4	
MM-6	Stable	13:51	292.0	14.6	16.9	4.7	
MM-7	Stable	13:57	0.0	0.0	3.7	17.5	
MM-8	Stable	14:10	0.0	0.0	3.7	17.5	need lock
MM-9	Stable	14:54	0.0	0.0	4.4	17.0	
MM-10	Stable	14:45	990.0	49.5	33.8	0.6	
MM-11	Stable	14:41	838.0	41.9	33.8	0.2	need 1" cap w/ coupler
MM-12	Stable	14:36	1218.0	60.9	36.4	0.3	need 1" cap w/ coupler
MM-13	Stable	14:31	0.0	0.0	14.5	3.7	need 1" cap w/ coupler
SM-1a	Stable	14:02	0.0	0.0	0.1	20.9	Need plastic sign
SM-1b	Stable	14:01	0.0	0.0	0.1	20.8	Need plastic sign
SM-1c	Stable	14:04	0.0	0.0	0.1	20.9	Need plastic sign
SM-2	Stable	14:08	0.0	0.0	0.0	20.9	Need plastic sign
SM-3	Stable	14:50	0.0	0.0	0.1	20.9	Need plastic sign
MW-12	Stable	14:59	0.0	0.0	0.1	19.9	Could not access SM-4
VB-1*	Stable	15:13	42.0	2.1	1.1	20.3	
MW-4*	Stable	15:08	910.0	45.5	35.7	0.7	
MW-5*	Stable	15:02	6.0	0.3	4.2	16.8	

Notes:

1. If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes, contact Haywood County Solid Waste Director immediately.
2. *To be monitored from 11/15/10 to 11/15/11. May be dropped from monitoring after assessment

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: J Bishop/ D Pasko **Date:** December 29, 2010

Weather Conditions: Clear/ 8" snow **Ambient Temp:** 20°

Atmospheric Pressure: 27.20"

Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #:** GM11944/09

Factory Calibration Date: August 27, 2010 **Field Calibration Date :** December 29, 2010

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Stable	12:00	596.0	29.8	24.3	0.6	Need to replace lock/ label
MM-2	Stable	11:54	1012.0	50.6	35.1	0.1	Need to replace lock/ label
MM-3	Stable	11:49	876.0	43.8	33.0	0.4	
MM-4	Stable	11:44	442.0	22.1	24.2	2.7	
MM-5	Stable	11:41	0.0	0.0	5.5	18.0	
MM-6	Stable	11:37	198.0	9.9	14.9	5.7	
MM-7	Stable	11:33	0.0	0.0	2.7	18.8	
MM-8	Stable	11:23	0.0	0.0	2.7	19.2	need lock
MM-9	Stable	12:43	0.0	0.0	2.8	18.3	
MM-10	Stable	-		-	-	-	covered w/ snow, could not sample
MM-11	Stable	10:31	1030.0	51.5	34.1	0.2	
MM-12	Stable	10:24	1216.0	60.8	38.9	0.2	
MM-13	Stable	-		-	-	-	covered w/ snow, could not sample
SM-1a	Stable	11:25	0.0	0.0	0.2	21.2	Need plastic sign
SM-1b	Stable	11:27	0.0	0.0	0.2	21.2	Need plastic sign
SM-1c	Stable	11:29	0.0	0.0	0.1	21.2	Need plastic sign
SM-2	Stable	11:21	2.0	0.1	0.2	21.1	Need plastic sign
SM-3	Stable	-		-	-	-	could not access building
MW-12	Stable	10:57	0.0	0.0	0.2	21.0	Could not access SM-4
VB-1*	Stable	-		-	-	-	could not access due to snow
MW-4*	Stable	11:15	220.0	11.0	10.0	15.0	
MW-5*	Stable	12:32	0.0	0.0	0.8	20.9	

Notes:

1. If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes, contact Haywood County Solid Waste Director immediately.
2. *To be monitored from 11/15/10 to 11/15/11. May be dropped from monitoring after assessment period is complete.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: DP **Date: January 31, 2011**

Weather Conditions: Overcast **Ambient Temp: 39° @ 10 a.m., 51° @ 1 p.m.**

Atmospheric Pressure: 27.29" Hg

Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**

Factory Calibration Date: August 27, 2010 **Field Calibration Date : January 31, 2011**

Well or Probe ID	Stable Readings	Time	%LEL	%CH_4	%CO_2	%O_2	Notes:
MM-1	Meter lost battery charge, see 2/1/11 for readings						
MM-2	Meter lost battery charge, see 2/1/11 for readings						
MM-3	Meter lost battery charge, see 2/1/11 for readings						
MM-4	Meter lost battery charge, see 2/1/11 for readings						
MM-5	Y	12:51	2.0	0.1	0.4	20.5	
MM-6	Meter lost battery charge, see 2/1/11 for readings						
MM-7	Y	12:12	0.0	0.0	3.0	17.7	
MM-8	Y	12:30	0.0	0.0	1.3	19.8	
MM-9	Y	11:45	0.0	0.0	3.1	17.3	
MM-10	Y	11:00	1128.0	56.4	35.0	0.2	
MM-11	Meter lost battery charge, see 2/1/11 for readings						
MM-12	Y	10:41	1230.0	61.5	38.1	0.2	
MM-13	Meter lost battery charge, see 2/1/11 for readings						Needs plastic cap & metal cover
SM-1a	Y	12:15	0.0	0.0	0.2	20.8	
SM-1b	Y	12:18	0.0	0.0	0.2	20.7	
SM-1c	Y	12:21	0.0	0.0	0.1	20.8	
SM-2	Y	12:24	0.0	0.0	0.1	20.8	
SM-3	Y	11:30	0.0	0.0	0.2	21.0	
MW12	Y	11:48	0.0	0.0	0.2	20.9	Cap doesn't lock
VB-1*	No	12:35	160.0	8.0	3.5	9.0	Readings not stable
MW-4*	Y	11:50	0.0	0.0	0.2	20.8	
MW-5*	Y	11:35	0.0	0.0	0.4	20.8	Needs metal cover

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: DP **Date: February 1, 2011**
Weather Conditions: Rain **Ambient Temp: 42°**
Atmospheric Pressure: 27.25" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: August 27, 2010 **Field Calibration Date : February 1, 2011**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	9:59	968.0	48.4	30.3	0.4	
MM-2	Y	9:55	1008.0	50.4	31.2	0.2	
MM-3	Y	9:51	908.0	45.4	29.8	2.1	
MM-4	Y	9:40	420.0	21.0	21.5	3.1	
MM-5							
MM-6	Y	9:47	176.0	8.8	14.9	3.3	
MM-7							
MM-8	See monitoring results for January 31, 2011 for locations not shown here						
MM-9							
MM-10							
MM-11	Y	9:30	1080.0	54.0	33.4	0.2	
MM-12							
MM-13	Y	9:21	0.0	0.0	7.8	10.6	Needs plastic cap & metal cover
SM-1a							
SM-1b							
SM-1c							
SM-2							
SM-3							
SM-4*							
VB-1*							
MW-4*							
MW-5*							

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: DP **Date: February 28, 2011**

Weather Conditions: Overcast **Ambient Temp: 64°**

Atmospheric Pressure: 27.02" Hg

Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**

Factory Calibration Date: August 27, 2010 **Field Calibration Date : February 28, 2011**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Meter lost battery charge, see 2/1/11 for readings						
MM-2	harge, see 2/1/11 for readings						
MM-3	Y						
MM-4	Y						
MM-5	Y	12:08		0.0	0.6	19.9	
MM-6	harge, see 2/1/11 for readings						
MM-7	Y	11:45		0.0	2.6	17.6	
MM-8	Y	11:40		0.0	1.5	19.8	
MM-9	Y	11:50		0.0	1.4	19.1	
MM-10	Y	10:50		52.2	35.0	0.2	
MM-11	harge, see 2/1/11 for readings						
MM-12	Y	10:35		61.3	38.4	0.2	
MM-13	harge, see 2/1/11 for readings						
SM-1a	Y	11:15		0.0	0.2	25.0	
SM-1b	Y	11:18		0.0	0.1	25.0	
SM-1c	Y	11:21		0.0	0.2	24.9	
SM-2	Y	11:24		0.0	0.2	25.0	
SM-3	Y	11:05		0.0	0.1	20.3	
MW-12	Y	11:52		0.0	0.1	20.6	Cap doesn't lock
VB-1*	No	11:28		40.0	26.0	6.0	Not stable, readings approx. only
MW-4*	No	Noon		45.0	32.0	4.0	Not stable, readings approx. only
MW-5*	No	11:55		9.0	14.8	6.8	Not stable, readings approx. only

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: DP, KS **Date: March 17, 2011**
Weather Conditions: Foggy but clearing **A4mbient Temp: 37°**
Atmospheric Pressure: 27.42" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: August 27, 2010 **Field Calibration Date : March 17, 2011**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:19	0.0	0.0	0.5	20.3	Need MM # on metal casing
MM-2	Y	12:16	1396.0	69.8	23.1	1.3	Need MM # on metal casing
MM-3	Y	12:12	996.0	49.8	32.3	1.2	
MM-4	Y	11:56	252.0	12.6	16.7	2.8	
MM-5	Y	12:02	0.0	0.0	0.3	20.3	
MM-6	Y	12:06	190.0	9.5	12.2	5.2	
MM-7	Y	11:30	0.0	0.0	3.9	16.4	
MM-8	Y	11:35	0.0	0.0	1.1	19.6	
MM-9	Y	11:05	2.0	0.1	3.7	16.2	
MM-10	Y	10:53	1088.0	54.4	35.7	0.6	
MM-11	Y	10:51	1154.0	57.7	34.9	0.3	
MM-12	Y	10:47	1220.0	61.0	38.2	0.5	
MM-13	Y	10:41	2.0	0.1	6.1	12.7	
SM-1a	Y	11:25	0.0	0.0	0.1	20.6	
SM-1b	Y	11:26	0.0	0.0	0.1	20.6	
SM-1c	Y	11:28	0.0	0.0	0.1	20.6	
SM-2	Y	11:32	0.0	0.0	0.1	20.5	
SM-3	Y	11:40	0.0	0.0	0.1	20.5	
MW-12	Y	11:08	0.0	0.0	0.2	20.6	
VB-1*	No	11:45					Not stable, invalid readings
MW-4*	No	11:20					Not stable, invalid readings
MW-5*	No	11:15					Not stable, invalid readings

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

Field Observation Notes:

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: DP **Date: April 28, 2011**
Weather Conditions: Clearing **Ambient Temp: 68°**
Atmospheric Pressure: 26.98" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: April 7, 2011 **Field Calibration Date : April 28, 2011**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	11:34	10.0	0.5	1.5	19.7	Need MM # on metal casing
MM-2	Y	11:29	1118.0	55.9	31.2	2.9	Need MM # on metal casing
MM-3	Y	11:24	910.0	45.5	31.9	2.1	
MM-4	Y	11:10	260.0	13.0	13.0	4.7	
MM-5	Y	11:14	0.0	0.0	0.4	19.1	
MM-6	Y	11:17	472.0	23.6	13.5	3.7	
MM-7	Y	10:51	0.0	0.0	3.1	16.9	
MM-8	Y	10:46	0.0	0.0	1.5	18.9	
MM-9	Y	10:35	0.0	0.0	6.2	11.8	
MM-10	Y	10:21	174.0	8.7	12.3	10.5	
MM-11	Y	10:18	1172.0	58.6	36.4	0.4	
MM-12	Y	10:15	1188.0	59.4	38.6	0.6	
MM-13	Y	10:05	0.0	0.0	0.1	20.5	
SM-1a	Y	10:54	0.0	0.0	0.1	20.4	
SM-1b	Y	10:55	0.0	0.0	0.1	20.5	
SM-1c	Y	10:56	0.0	0.0	0.1	20.5	
SM-2	Y	10:44	0.0	0.0	0.0	20.5	
SM-3	Y	10:29	0.0	0.0	0.1	20.4	
MW-12	Y	10:35	0.0	0.0	1.6	18.6	
VB-1*	No	10:58					Not stable, invalid readings
MW-4*	No	10:42					Not stable, invalid readings
MW-5*	Y	10:32	0.0	0.0	0.6	20.1	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS
Weather Conditions: Overcast, Warm
Atmospheric Pressure: 26.98" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: April 7, 2011

Date: June 3, 2011
Ambient Temp: 72°

Serial #: 11944/09
Field Calibration Date : June 3, 2011

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:40	1270.0	63.5	29.9	0.7	Need MM # on metal casing
MM-2	Y	12:25	1238.0	61.9	38.0	0.1	Need MM # on metal casing
MM-3	Y	12:10	1098.0	54.9	37.9	0.2	
MM-4	Y	11:30	644.0	32.2	18.1	1.2	
MM-5	Y	11:40	0.0	0.0	3.2	18.0	
MM-6	Y	11:55	498.0	24.9	15.8	2.2	
MM-7	Y	11:20	0.0	0.0	3.5	16.6	
MM-8	Y	10:55	0.0	0.0	2.8	17.6	
MM-9	Y	10:10	0.0	0.0	4.8	14.8	
MM-10	Y	9:50	1026.0	51.3	37.9	0.2	
MM-11	Y	9:44	998.0	49.9	35.2	0.5	
MM-12	Y	9:36	1202.0	60.1	38.9	0.3	
MM-13	Y	9:26	0.0	0.0	2.3	18.5	
SM-1a	Y	11:00	0.0	0.0	0.0	20.2	
SM-1b	Y	11:05	0.0	0.0	0.0	20.2	
SM-1c	Y	11:10	0.0	0.0	0.0	20.3	
SM-2	Y	10:50	0.0	0.0	0.0	20.2	
SM-3	Y	10:00	0.0	0.0	0.0	20.1	
MW-12	Y	10:15	0.0	0.0	1.6	20.0	
VB-1*	No	10:45					Not stable, invalid readings
MW-4*	No	10:40					Not stable, invalid readings
MW-5	Y	10:20	0.0	0.0	0.6	19.7	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS
Weather Conditions: Sunny, Warm
Atmospheric Pressure: 27.23" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: April 7, 2011

Date: June 30, 2011
Ambient Temp: 62°

Serial #: 11944/09
Field Calibration Date : June 30, 2011

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	11:45	614.0	30.7	17.0	10.0	Need MM # on metal casing
MM-2	Y	11:30	1138.0	56.9	37.0	0.8	Need MM # on metal casing
MM-3	Y	11:15	1014.0	50.7	36.1	1.7	
MM-4	Y	10:45	544.0	27.2	20.6	1.0	
MM-5	Y	10:55	0.0	0.0	4.2	17.2	
MM-6	Y	11:05	386.0	19.3	14.7	4.0	
MM-7	Y	10:25	0.0	0.0	3.6	16.2	
MM-8	Y	10:00	0.0	0.0	4.1	15.4	
MM-9	Y	9:23	0.0	0.0	4.5	15.6	
MM-10	Y	9:13	1058.0	52.9	38.1	0.5	
MM-11	Y	9:01	1010.0	50.5	35.6	0.8	
MM-12	Y	8:50	1206.0	60.3	39.3	0.2	
MM-13	Y	8:26	0.0	0.0	5.1	14.3	
SM-1a	Y	10:05	0.0	0.0	0.0	20.5	
SM-1b	Y	10:10	0.0	0.0	0.0	20.5	
SM-1c	Y	10:15	0.0	0.0	0.0	20.5	
SM-2	Y	9:50	0.0	0.0	0.0	20.5	
SM-3	Y	10:35	0.0	0.0	0.0	20.4	
MW-12	Y	9:30	0.0	0.0	0.1	20.3	
VB-1*	No	10:30					Not stable, invalid readings
MW-4*	Y	9:40	74.0	3.7	2.8	18.9	Replaced cap stable valid readings
MW-5	Y	9:35	0.0	0.0	0.1	20.4	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

Field Observation Notes:

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS **Date: July 28, 2011**
Weather Conditions: Sunny, Warm **Ambient Temp: 72°**
Atmospheric Pressure: 27.26" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: April 7, 2011 **Field Calibration Date : July 28, 2011**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:40	1282.0	64.1	33.4	1.0	Need MM # on metal casing
MM-2	Y	12:35	1118.0	55.9	37.7	0.2	Need MM # on metal casing
MM-3	Y	12:25	1098.0	54.9	37.5	0.9	
MM-4	Y	12:00	576.0	28.8	21.6	1.4	
MM-5	Y	12:10	0.0	0.0	4.3	16.3	
MM-6	Y	12:15	488.0	24.4	16.5	2.2	
MM-7	Y	11:30	0.0	0.0	4.0	16.1	
MM-8	Y	11:20	0.0	0.0	3	17.2	
MM-9	Y	10:40	0.0	0.0	4.4	16.1	
MM-10	Y	10:30	1098.0	54.9	37.9	0.2	
MM-11	Y	10:15	1076.0	53.8	37.4	0.2	
MM-12	Y	10:00	1220.0	61.0	38.6	0.3	Pad damaged - cracked/broken
MM-13	Y	9:40	0.0	0.0	3.4	18.6	Replaced cap
SM-1a	Y	11:15	0.0	0.0	0.0	20.0	
SM-1b	Y	11:20	0.0	0.0	0.0	20.1	
SM-1c	Y	11:25	0.0	0.0	0.0	20.1	
SM-2	Y	11:10	0.0	0.0	0.0	20.1	
SM-3	Y	11:55	0.0	0.0	0.0	20.1	
MW-12	Y	10:45	0.0	0.0	0.0	20.0	
VB-1*	No	11:40					Not stable, invalid readings
MW-4*	Y	11:00	40.0	2.0	1.8	19.0	
MW-5	Y	10:50	0.0	0.0	0.2	19.8	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.
Field Observation Notes: MM-12, concrete pad damaged, cracked/broken, possibly from construction activity

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS
Weather Conditions: Sunny, Warm
Atmospheric Pressure: 27.28" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: April 7, 2011

Date: September 2, 2011
Ambient Temp: 70°

Serial #: 11944/09
Field Calibration Date : September 2, 2011

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:20	1064.0	53.2	33.5	1.5	Need MM # on metal casing
MM-2	Y	12:15	1164.0	58.2	37.6	3.8	Need MM # on metal casing
MM-3	Y	12:05	1062.0	53.1	36.5	1.4	
MM-4	Y	11:40	508.0	25.4	23.8	1.6	
MM-5	Y	11:50	0.0	0.0	3.0	17.8	
MM-6	Y	11:55	416.0	20.8	16.4	3.0	
MM-7	Y	11:15	0.0	0.0	3.7	16.7	
MM-8	Y	10:55	0.0	0.0	3	17.9	
MM-9	Y	10:20	0.0	0.0	3.9	17.6	
MM-10	Y	10:15	918.0	45.9	36.1	0.7	
MM-11	Y	10:10	830.0	41.5	34.8	0.8	
MM-12	Y	10:00	1208.0	60.4	39.0	0.4	Pad damaged - cracked/broken
MM-13	Y	9:30	0.0	0.0	1.2	19.1	
SM-1a	Y	11:00	0.0	0.0	0.0	20.0	
SM-1b	Y	11:05	0.0	0.0	0.0	20.0	
SM-1c	Y	11:10	0.0	0.0	0.0	20.1	
SM-2	Y	10:50	0.0	0.0	0.0	20.0	
SM-3	Y	11:20	0.0	0.0	0.0	20.2	
MW-12	Y	10:30	0.0	0.0	0.0	20.1	
VB-1*	No	11:20					not accessible
MW-4*	Y	10:45	22.0	1.1	1.4	19.4	
MW-5	Y	10:40	0.0	0.0	0.1	20.2	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

Field Observation Notes:

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS
Weather Conditions: Cool, Overcast
Atmospheric Pressure: 27.03" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: April 7, 2011

Date: September 29, 2011
Ambient Temp: 58°

Serial #: 11944/09
Field Calibration Date : September 29, 2011

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	11:50	1268.0	63.4	35.0	1.0	Added MM # on metal casing
MM-2	Y	11:45	1224.0	61.2	36.5	1.0	Added MM # on metal casing
MM-3	Y	11:40	1056.0	52.8	35.7	1.4	
MM-4	Y	11:20	446.0	22.3	25.7	1.2	
MM-5	Y	11:25	0.0	0.0	4.1	17.6	
MM-6	Y	11:30	352.0	17.6	15.9	3.6	
MM-7	Y	11:10	0.0	0.0	4.0	16.6	
MM-8	Y	10:45	0.0	0.0	3	17.8	
MM-9	Y	10:10	0.0	0.0	3.8	17.6	
MM-10	Y	10:05	1128.0	56.4	36.5	0.4	
MM-11	Y	10:00	858.0	42.9	33.5	1.4	
MM-12	Y	9:50	1216.0	60.8	39.0	0.1	Pad damaged - cracked/broken
MM-13	Y	9:40	0.0	0.0	0.3	20.3	
SM-1a	Y	10:55	0.0	0.0	0.0	20.4	
SM-1b	Y	11:00	0.0	0.0	0.0	20.4	
SM-1c	Y	11:05	0.0	0.0	0.0	20.5	
SM-2	Y	10:40	0.0	0.0	0.0	20.4	
SM-3	Y	11:15	0.0	0.0	0.0	20.4	
MW-12	Y	10:15	0.0	0.0	0.0	20.3	
VB-1*	No	11:10					
MW-4*	Y	10:30	12.0	0.6	1.0	19.7	
MW-5	Y	10:20	0.0	0.0	0.1	20.1	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

Field Observation Notes:

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS
Weather Conditions: Cool, Drizzle
Atmospheric Pressure: 27.28" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: November 7, 2011

Date: December 16, 2011
Ambient Temp: 56°

Serial #: 11944/09
Field Calibration Date : December 16, 2011

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	11:40	522.0	26.1	17.5	11.9	
MM-2	Y	11:35	1232.0	61.6	34.9	1.5	
MM-3	Y	11:30	804.0	40.2	32.6	1.8	
MM-4	Y	11:10	224.0	11.2	15.8	7.2	
MM-5	Y	11:15	0.0	0.0	0.8	20.5	
MM-6	Y	11:20	150.0	7.5	12.6	5.6	
MM-7	Y	11:00	0.0	0.0	2.8	18.0	
MM-8	Y	10:30	0.0	0.0	2.4	18.5	
MM-9	Y	10:05	0.0	0.0	2.8	18.0	
MM-10	Y	10:00	1160.0	58.0	35.6	0.3	
MM-11	Y	9:50	814.0	40.7	31.1	2.3	
MM-12	Y	9:45	1230.0	61.5	37.9	0.5	Pad repaired
MM-13	Y	9:30	0.0	0.0	12.6	3.9	
SM-1a	Y	10:35	0.0	0.0	0.0	21.0	
SM-1b	Y	10:40	0.0	0.0	0.0	21.0	
SM-1c	Y	10:45	0.0	0.0	0.0	21.1	
SM-2	Y	10:25	0.0	0.0	0.0	21.1	
SM-3	Y	10:20	0.0	0.0	0.0	21.1	
MW-12	Y	10:15	0.0	0.0	0.0	21.1	
VB-1							Not Sampled
MW-4							Not Sampled
MW-5							Not Sampled

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.
Field Observation Notes: MM-12 concrete pad has been repaired.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS
Weather Conditions: Cool, Sunny
Atmospheric Pressure: 27.44" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: November 7, 2011

Date: February 28, 2012
Ambient Temp: 55°

Serial #: 11944/09
Field Calibration Date : February 28, 2012

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	2:30	902.0	45.1	22.3	1.8	
MM-2	Y	2:25	1034.0	51.7	32.7	0.5	
MM-3	Y	2:20	954.0	47.7	30.1	2.2	cover hasp difficult to unlock/lock
MM-4	Y	2:05	378.0	18.9	13.1	5.7	
MM-5	Y	2:10	358.0	17.9	11.5	4.5	
MM-6	Y	2:15	2.0	0.1	3.7	16.4	
MM-7	Y	1:55	0.0	0.0	2.6	17.4	
MM-8	Y	1:50	0.0	0.0	2.3	18.6	
MM-9	Y	12:50	0.0	0.0	2.2	17.9	
MM-10	Y	12:35	408.0	20.4	31.4	0.5	
MM-11	Y	12:30	874.0	43.7	30.9	0.5	
MM-12	Y	12:20	1272.0	63.6	35.6	0.6	
MM-13	Y	12:14	2.0	0.1	13.5	1.0	
SM-1a	Y	1:45	0.0	0.0	0.0	21.0	
SM-1b	Y	1:40	0.0	0.0	0.0	21.1	
SM-1c	Y	1:35	0.0	0.0	0.0	21.1	
SM-2	Y	1:30	0.0	0.0	0.0	21.0	
SM-3	Y	1:20	0.0	0.0	0.0	21.0	
MW-12	Y	1:14	0.0	0.0	0.0	21.1	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS, RS | **Date: March 29, 2012**
Weather Conditions: Warm, Overcast | **Ambient Temp: 74°**
Atmospheric Pressure: 27.18" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 | **Serial #: 11944/09**
Factory Calibration Date: November 7, 2011 | **Field Calibration Date : March 29, 2012**

Well or Probe ID	Stable Readings	Time	%LEL	%CH_4	%CO_2	%O_2	Notes:
MM-1	Y	1:20	1348.0	67.4	26.4	0.2	
MM-2	Y	1:15	1288.0	64.4	35.3	0.2	
MM-3	Y	1:10	1094.0	54.7	33.6	0.4	cover hasp difficult to open/close
MM-4	Y	12:50	682.0	34.1	18.2	0.4	
MM-5	Y	12:55	0.0	0.0	6.1	13.8	
MM-6	Y	1:05	472.0	23.6	14.6	0.2	
MM-7	Y	12:35	0.0	0.0	3.5	16.3	
MM-8	Y	12:20	0.0	0.0	3.4	16.6	
MM-9	Y	12:00	0.0	0.0	3.3	16.1	
MM-10	Y	11:50	88.0	4.4	26.6	0.2	
MM-11	Y	11:40	904.0	45.2	32.5	0.2	
MM-12	Y	11:35	1240.0	62.0	37.5	0.3	
MM-13	Y	11:25	16.0	0.8	15.2	0.8	cap not secure
SM-1a	Y	12:25	0.0	0.0	0.0	20.9	
SM-1b	Y	12:28	0.0	0.0	0.1	20.8	
SM-1c	Y	12:30	0.0	0.0	0.0	20.9	
SM-2	Y	12:15	0.0	0.0	0.0	20.8	
SM-3	Y	12:10	0.0	0.0	0.0	20.8	
MW-12	Y	12:05	0.0	0.0	0.0	20.6	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: KS, RS
Weather Conditions: Cold, Cloudy
Atmospheric Pressure: 26.95" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: November 7, 2011

Date: April 24, 2012
Ambient Temp: 53°

Serial #: 11944/09
Field Calibration Date : April 24, 2012

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	1:35	810.0	40.5	19.0	7.7	
MM-2	Y	1:30	1284.0	64.2	34.7	0.9	
MM-3	Y	1:25	1148.0	57.4	36.2	0.3	cover hasp difficult to open/close
MM-4	Y	12:50	678.0	33.9	19.8	0.7	
MM-5	Y	1:00	0.0	0.0	4.8	16.1	
MM-6	Y	1:10	368.0	18.4	13.9	2.3	
MM-7	Y	11:25	0.0	0.0	3.8	16.5	
MM-8	Y	11:05	0.0	0.0	5.3	15.3	
MM-9	Y	10:45	0.0	0.0	5.1	15.3	
MM-10	Y	10:40	2.0	0.1	20.2	1.2	
MM-11	Y	10:30	836.0	41.8	33.2	0.4	
MM-12	Y	10:25	1226.0	61.3	38.3	0.2	
MM-13	Y	10:15	40.0	2.0	16.5	0.1	cap not secure
SM-1a	Y	11:10	2.0	0.1	0.1	21.2	
SM-1b	Y	11:15	0.0	0.0	0.1	21.3	
SM-1c	Y	11:20	0.0	0.0	0.0	21.3	
SM-2	Y	11:00	0.0	0.0	0.0	21.3	
SM-3	Y	10:55	0.0	0.0	0.0	21.3	
MW-12	Y	10:50	0.0	0.0	0.1	21.2	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: May 28, 2012**
Weather Conditions: Partly Cloudy, Humidity 75% **Ambient Temp: 70°**
Atmospheric Pressure: 27.26" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: November 7, 2011 **Field Calibration Date : May 28, 2012**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	11:33	1390.0	69.5	30.2	0.2	
MM-2	Y	11:45	1268.0	63.4	36.2	0.2	
MM-3	Y	11:50	1166.0	58.3	36.3	0.3	cover hasp difficult to open/close
MM-4	Y	12:00	902.0	45.1	20.4	0.2	
MM-5	Y	12:08	0.0	0.0	3.2	17.5	
MM-6	Y	12:17	512.0	25.6	15.2	0.2	
MM-7	Y	12:32	0.0	0.0	3.8	15.0	
MM-8	Y	12:45	0.0	0.0	5.9	13.9	
MM-9	Y	12:54	0.0	0.0	4.4	14.5	
MM-10	Y	13:16	244.0	12.2	24.1	0.3	
MM-11	Y	13:27	958.0	47.9	32.2	0.3	
MM-12	Y	13:35	1236.0	61.8	36.8	0.2	
MM-13	Y	13:45	10.0	0.5	16.1	0.6	cap not secure
SM-1a	Y	9:09	0.0	0.0	0.3	20.2	
SM-1b	Y	9:05	0.0	0.0	0.1	20.6	
SM-1c	Y	9:15	0.0	0.0	0.3	20.2	
SM-2	Y	9:23	0.0	0.0	0.0	20.4	
SM-3	Y	12:50	0.0	0.0	0.0	19.8	
MW-12	Y	12:58	0.0	0.0	0.1	19.6	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: June 27, 2012**
Weather Conditions: Clear, Humidity 28% **Ambient Temp: 79°**
Atmospheric Pressure: 27.24" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: November 7, 2011 **Field Calibration Date : June 27, 2012**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	15:55	1298.0	64.9	35.0	0.1	
MM-2	Y	16:02	1200.0	60.0	37.4	0.2	
MM-3	Y	16:10	1176.0	58.8	38.2	0.2	cover hasp difficult to open/close
MM-4	Y	16:19	780.0	39.0	23.0	0.2	
MM-5	Y	16:25	0.0	0.0	3.4	16.9	
MM-6	Y	16:33	438.0	21.9	15.5	0.2	
MM-7	Y	17:09	0.0	0.0	3.8	15.5	
MM-8	Y	17:03	0.0	0.0	5.9	15.2	
MM-9	Y	17:21	0.0	0.0	4.3	15.5	
MM-10	Y	18:20	230.0	11.5	25.7	0.2	Car parked over the access
MM-11	Y	18:06	914.0	45.7	33.9	0.3	
MM-12	Y	17:57	1222.0	61.1	38.5	0.3	
MM-13	Y	17:45	0.0	0.0	16.7	3.2	cap not secure
SM-1a	Y	16:50	0.0	0.0	0.0	19.8	
SM-1b	Y	16:53	0.0	0.0	0.0	19.7	
SM-1c	Y	16:56	0.0	0.0	0.0	19.7	
SM-2	Y	16:59	0.0	0.0	0.0	19.8	
SM-3	Y	17:15	0.0	0.0	0.0	19.9	
MW-12	Y	17:30	0.0	0.0	0.0	19.8	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: July 25, 2012**
Weather Conditions: Partly Cloudy, Humidity 63% **Ambient Temp: 80°**
Atmospheric Pressure: 27.26" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: November 7, 2011 **Field Calibration Date : July 25, 2012**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:19	1284.0	64.2	35.5	0.2	
MM-2	Y	12:26	1234.0	61.7	38.0	0.2	
MM-3	Y	12:33	1152.0	57.6	38.7	0.3	cover hasp difficult to open/close
MM-4	Y	12:48	618.0	30.9	24.5	0.2	
MM-5	Y	12:58	0.0	0.0	3.8	17.0	
MM-6	Y	13:04	386.0	19.3	15.7	0.2	
MM-7	Y	13:39	0.0	0.0	3.8	15.6	
MM-8	Y	13:59	0.0	0.0	6.2	14.2	
MM-9	Y	14:16	0.0	0.0	4.0	15.9	
MM-10	Y	14:33	406.0	20.3	28.1	0.2	Car parked over the access
MM-11	Y	14:49	844.0	42.2	33.0	0.3	
MM-12	Y	14:58	1224.0	61.2	38.4	0.3	
MM-13	Y	15:07	0.0	0.0	14.4	5.9	cap not secure
SM-1a	Y	13:43	0.0	0.0	0.0	19.8	
SM-1b	Y	13:46	0.0	0.0	0.0	19.8	
SM-1c	Y	13:50	0.0	0.0	0.0	19.7	
SM-2	Y	13:55	0.0	0.0	0.0	19.8	
SM-3	Y	14:12	0.0	0.0	0.0	19.8	
MW-12	Y	14:21	0.0	0.0	0.0	19.7	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: August 27, 2012**
Weather Conditions: Clear, Humidity 83% **Ambient Temp: 65°**
Atmospheric Pressure: 27.37" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000 **Serial #: 11944/09**
Factory Calibration Date: November 7, 2011 **Field Calibration Date : August 27, 2012**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	11:45	1272.0	63.6	35.9	0.3	
MM-2	Y	11:51	1232.0	61.6	38.0	0.2	
MM-3	Y	11:58	1148.0	57.4	38.9	0.2	cover hasp difficult to open/close
MM-4	Y	12:10	610.0	30.5	27.2	0.2	
MM-5	Y	12:17	0.0	0.0	3.3	17.4	
MM-6	Y	12:25	398.0	19.9	16.6	0.2	
MM-7	Y	12:34	0.0	0.0	4.3	15.8	
MM-8	Y	12:55	0.0	0.0	5.8	15.3	
MM-9	Y	13:06	0.0	0.0	3.8	17.0	
MM-10	Y	13:25	350.0	17.5	27.9	0.2	
MM-11	Y	13:35	806.0	40.3	32.6	7.7	
MM-12	Y	13:44	1230.0	61.5	37.9	0.2	
MM-13	Y	13:53	0.0	0.0	13.0	7.7	cap not secure
SM-1a	Y	12:46	0.0	0.0	0.0	19.9	
SM-1b	Y	12:39	0.0	0.0	0.0	19.9	
SM-1c	Y	12:43	0.0	0.0	0.0	19.9	
SM-2	Y	12:50	0.0	0.0	0.0	20.0	
SM-3	Y	13:02	0.0	0.0	0.0	20.0	
MW-12	Y	13:10	0.0	0.0	0.0	20.0	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Partly Cloudy
Atmospheric Pressure: 27.12" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000
Factory Calibration Date: November 7, 2011

Date: September 29, 2012
Ambient Temp: 70°

Serial #: 11944/09
Field Calibration Date : September 29, 2012

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	13:50	1370.0	68.5	36.3	0.1	
MM-2	Y	13:56	1310.0	65.5	38.5	0.1	
MM-3	Y	14:03	1094.0	54.7	38.8	0.1	cover hasp difficult to open/close
MM-4	Y	14:15	536.0	26.8	29.1	0.0	
MM-5	Y	14:22	0.0	0.0	4.6	16.9	
MM-6	Y	14:30	342.0	17.1	17.1	0.1	
MM-7	Y	14:39	0.0	0.0	3.9	16.7	
MM-8	Y	14:59	0.0	0.0	5.1	16.4	
MM-9	Y	15:11	0.0	0.0	3.5	18.0	
MM-10	Y	15:30	346.0	17.3	26.9	0.3	
MM-11	Y	15:40	770.0	38.5	32.9	0.3	
MM-12	Y	15:49	1246.0	62.3	38.2	0.4	
MM-13	Y	15:58	0.0	0.0	12.5	8.5	
SM-1a	Y	14:50	0.0	0.0	0.0	20.2	
SM-1b	Y	14:34	0.0	0.0	0.0	20.2	
SM-1c	Y	14:48	0.0	0.0	0.0	20.2	
SM-2	Y	14:55	0.0	0.0	0.0	20.2	
SM-3	Y	15:07	0.0	0.0	0.0	20.2	
MW-12	Y	15:17	0.0	0.0	0.0	20.2	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Partly Cloudy 48% Humidity
Atmospheric Pressure: 27.13" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: October 26, 2012
Ambient Temp: 70°

Serial #: 11944
Field Calibration Date : October 26, 2012

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	4:38:00 PM	1216.0	60.8	32.7	0.0	
MM-2	Y	4:45:00 PM	1248.0	62.4	37.4	0.1	
MM-3	Y	4:51:00 PM	1066.0	53.3	37.3	0.1	cover hasp difficult to open/close
MM-4	Y	4:59:00 PM	570.0	28.5	29.0	0.0	
MM-5	Y	5:04:00 PM	0.0	0.0	4.8	17.4	
MM-6	Y	5:12:00 PM	290.0	14.5	16.2	0.1	
MM-7	Y	3:19:00 PM	0.0	0.0	3.8	16.3	
MM-8	Y	3:27:00 PM	0.0	0.0	4.9	15.9	
MM-9	Y	3:38:00 PM	0.0	0.0	3.0	18.0	
MM-10	Y	3:52:00 PM	334.0	16.7	25.9	0.1	
MM-11	Y	4:08:00 PM	778.0	38.9	32.4	0.0	
MM-12	Y	4:14:00 PM	1246.0	62.3	37.4	0.1	
MM-13	Y	4:21:00 PM	0.0	0.0	10.2	9.4	
SM-1a	Y	3:15:00 PM	0.0	0.0	0.0	19.9	
SM-1b	Y	3:12:00 PM	0.0	0.0	0.0	19.7	
SM-1c	Y	3:09:00 PM	0.0	0.0	0.0	19.6	
SM-2	Y	3:05:00 PM	0.0	0.0	0.0	19.7	
SM-3	Y	3:34:00 PM	0.0	0.0	0.0	20.6	
MW-12	Y	3:41:00 PM	0.0	0.0	0.0	20.5	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Clear 40% Humidity
Atmospheric Pressure: 27.36" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: November 30, 2012
Ambient Temp: 52°

Serial #: 11944
Field Calibration Date : November 30, 2012

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	5:02:00 PM	1300.0	65.0	32.5	0.1	
MM-2	Y	5:07:00 PM	1172.0	58.6	35.7	0.1	
MM-3	Y	5:14:00 PM	1068.0	53.4	34.6	0.2	cover hasp difficult to open/close
MM-4	Y	5:23:00 PM	454.0	22.7	27.9	0.2	
MM-5	Y	5:28:00 PM	0.0	0.0	3.0	19.7	
MM-6	Y	5:34:00 PM	204.0	10.2	15.3	0.1	
MM-7	Y	5:43:00 PM	0.0	0.0	3.9	17.9	
MM-8	Y	5:52:00 PM	0.0	0.0	4.3	18	
MM-9	Y	4:00:00 PM	0.0	0.0	4.1	17.9	
MM-10	Y	4:16:00 PM	384.0	19.2	24.9	0.2	
MM-11	Y	4:26:00 PM	780.0	39.0	31.1	0.2	
MM-12	Y	4:33:00 PM	1252.0	62.6	37.2	0.1	
MM-13	Y	4:43:00 PM	0.0	0.0	16.7	8.9	
SM-1a	Y	1:43:00 PM	0.0	0.0	0.1	21.0	
SM-1b	Y	1:40:00 PM	0.0	0.0	0.1	21.0	
SM-1c	Y	1:36:00 PM	0.0	0.0	0.1	21.0	Entrance Double Door Open
SM-2	Y	1:32:00 PM	0.0	0.0	0.0	21.0	Garage Door Open
SM-3	Y	3:54:00 PM	0.0	0.0	0.0	21.1	
MW-12	Y	4:05:00 PM	0.0	0.0	0.0	21.1	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Clear 64% Humidity
Atmospheric Pressure: 27.10" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: December 28, 2012
Ambient Temp: 38°

Serial #: 11944
Field Calibration Date : December 28, 2012

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	3:12:00 PM	1244.0	62.2	33.9	1.0	
MM-2	Y	3:24:00 PM	1166.0	58.3	33.7	0.9	
MM-3	Y	3:30:00 PM	980.0	49.0	33.0	1.1	cover hasp difficult to open/close
MM-4	Y	3:38:00 PM	430.0	21.5	25.3	1.3	
MM-5	Y	3:44:00 PM	0.0	0.0	1.5	20.0	
MM-6	Y	3:50:00 PM	144.0	7.2	14.0	0.9	
MM-7	Y	3:58:00 PM	0.0	0.0	3.1	18.1	
MM-8	Y	4:06:00 PM	0.0	0.0	4.2	17.6	
MM-9	Y	4:12:00 PM	0.0	0.0	3.1	18.7	
MM-10	Y	4:24:00 PM	304.0	15.2	24.2	1.1	
MM-11	Y	4:35:00 PM	726.0	36.3	29.6	1.4	
MM-12	Y	4:44:00 PM	1220.0	61.0	36.2	1.0	
MM-13	Y	4:52:00 PM	0.0	0.0	10.2	8.0	
SM-1a	Y	11:28:00 PM	0.0	0.0	0.0	21.2	
SM-1b	Y	11:32:00 AM	0.0	0.0	0.0	21.2	
SM-1c	Y	11:36:00 AM	0.0	0.0	0.0	21.2	
SM-2	Y	11:24:00 AM	0.0	0.0	0.0	21.1	
SM-3	Y	11:55:00 AM	0.0	0.0	0.0	21.0	
MW-12	Y	4:16:00 PM	0.0	0.0	0.2	20.9	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Partly Cloudy 57% Humidity
Atmospheric Pressure: 27.30" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: January 29, 201
Ambient Temp: 45°

Serial #: 11944
Field Calibration Date: 1/29/13

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$
MM-1	Y	9:59:00 AM	0.0	0.0	0.1	20.9
MM-2	Y	9:43:00 AM	1334.0	66.7	33.0	0.1
MM-3	Y	10:07:00 AM	946.0	47.3	33.6	0.2
MM-4	Y	10:15:00 AM	180.0	9.0	20.4	0.8
MM-5	Y	10:22:00 AM	0.0	0.0	3.8	13.3
MM-6	Y	10:30:00 AM	276.0	13.8	13.5	0.1
MM-7	Y	11:08:00 AM	0.0	0.0	3.5	16.5
MM-8	Y	11:17:00 AM	0.0	0.0	3.8	16.6
MM-9	Y	11:23:00 AM	0.0	0.0	2.7	17.6
MM-10	Y	11:34:00 AM	244.0	12.2	23.8	0.2
MM-11	Y	11:42:00 AM	812.0	40.6	30.3	0.1
MM-12	Y	11:50:00 AM	1258.0	62.9	36.9	0.1
MM-13	Y	11:58:00 AM	0.0	0.0	11.9	1.5
SM-1a	Y	10:42:00 AM	0.0	0.0	0.1	20.9
SM-1b	Y	10:45:00 AM	0.0	0.0	0.1	20.9
SM-1c	Y	10:49:00 AM	0.0	0.0	0.1	20.9
SM-2	Y	11:12:00 AM	0.0	0.0	0.0	20.7
SM-3	Y	11:27:00 AM	0.0	0.0	0.0	21.0
MW-12	Y	11:08:00 AM	0.0	0.0	0.0	20.8

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in prob
Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Clear 52% Humidity
Atmospheric Pressure: 26.86" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: February 27, 20
Ambient Temp: 39°

Serial #: 11944
Field Calibration Date: 2/27/13

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$
MM-1	Y	9:59:00 AM	4.0	0.2	1.1	20.4
MM-2	Y	9:43:00 AM	1360.0	68.0	31.9	0.0
MM-3	Y	10:07:00 AM	1096.0	54.8	34.7	0.1
MM-4	Y	10:15:00 AM	142.0	7.1	18.9	1.2
MM-5	Y	10:22:00 AM	2.0	0.1	0.2	20.6
MM-6	Y	10:30:00 AM	350.0	17.5	13.8	0.1
MM-7	Y	11:08:00 AM	0.0	0.0	4.3	15.7
MM-8	Y	11:17:00 AM	0.0	0.0	4.2	16.4
MM-9	Y	11:23:00 AM	0.0	0.0	5.7	14.7
MM-10	Y	11:34:00 AM	332.0	16.6	25.7	0.0
MM-11	Y	11:42:00 AM	1018.0	50.9	31.3	0.1
MM-12	Y	11:50:00 AM	1252.0	62.6	37.3	0.0
MM-13	Y	11:58:00 AM	24.0	1.2	12.8	0.0
SM-1a	Y	10:42:00 AM	2.0	0.1	0.1	20.7
SM-1b	Y	10:45:00 AM	2.0	0.1	0.2	20.7
SM-1c	Y	10:49:00 AM	0.0	0.0	0.1	20.7
SM-2	Y	11:12:00 AM	0.0	0.0	0.1	20.6
SM-3	Y	11:27:00 AM	0.0	0.0	0.1	20.9
MW-12	Y	11:08:00 AM	0.0	0.0	0.4	16.3

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in prob
Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Clear 58% Humidity
Atmospheric Pressure: 27.38" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: March 29, 2013
Ambient Temp: 26°

Serial #: 11944
Field Calibration Date: 3/29/13

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$
MM-1	Y	9:02:00 AM	2.0	0.1	0.9	20.6
MM-2	Y	9:09:00 AM	1264.0	63.2	32.1	0.1
MM-3	Y	9:15:00 AM	1010.0	50.5	33.9	0.2
MM-4	Y	9:23:00 AM	156.0	7.8	15.9	2.4
MM-5	Y	9:29:00 AM	2.0	0.1	0.2	21.3
MM-6	Y	9:35:00 AM	392.0	19.6	12.8	0.1
MM-7	Y	9:45:00 AM	2.0	0.1	3.8	16.7
MM-8	Y	10:05:00 AM	0.0	0.0	3.9	16.9
MM-9	Y	10:17:00 AM	0.0	0.0	4.0	17.2
MM-10	Y	10:22:00 AM	6.0	0.3	25.3	0.6
MM-11	Y	10:30:00 AM	784.0	39.2	30.4	0.2
MM-12	Y	10:37:00 AM	1260.0	63.0	36.7	0.1
MM-13	Y	10:44:00 AM	30.0	1.5	12.3	1.4
SM-1a	Y	9:51:00 AM	2.0	0.1	0.1	21.4
SM-1b	Y	9:53:00 AM	2.0	0.1	0.1	21.4
SM-1c	Y	9:56:00 AM	0.0	0.0	0.1	21.4
SM-2	Y	10:01:00 AM	0.0	0.0	0.1	21.4
SM-3	Y	10:09:00 AM	0.0	0.0	0.1	21.2
MW-12	Y	10:13:00 AM	0.0	0.0	0.1	21.2

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in prob
Haywood County Solid Waste Director immediatley at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: April 29, 2013**
Weather Conditions: Cloudy 86% Humidity **Ambient Temp: 54°**
Atmospheric Pressure: 27.13" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+ **Serial #: 11944**
Factory Calibration Date: September 27, 2012 **Field Calibration Date : April 29, 2013**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	10:42:00 AM	0.0	0.0	0.5	20.5	Well believed to be full of water
MM-2	Y	10:48:00 AM	1314.0	65.7	34.1	0.1	
MM-3	Y	10:55:00 AM	1056.0	52.8	34.7	0.1	Cover hasp difficult to open/close
MM-4	Y	10:59:00 AM	410.0	20.5	16.6	0.6	
MM-5	Y	11:03:00 AM	2.0	0.1	3.0	15.3	
MM-6	Y	11:10:00 AM	454.0	22.7	12.2	0.1	
MM-7	Y	10:19:00 AM	0.0	0.0	3.7	15.8	
MM-8	Y	10:14:00 AM	0.0	0.0	4	16.1	
MM-9	Y	10:03:00 AM	0.0	0.0	6.3	12.3	
MM-10	Y	9:54:00 AM	2.0	0.1	22.9	0.7	
MM-11	Y	9:45:00 AM	932.0	46.6	31.1	0.0	
MM-12	Y	9:38:00 AM	1240.0	62.0	37.8	0.0	Well access full of water
MM-13	Y	9:29:00 AM	62.0	3.1	13.8	0.1	
SM-1a	Y	10:24:00 AM	0.0	0.0	0.0	20.6	Garage Door Open
SM-1b	Y	10:26:00 AM	0.0	0.0	0.1	20.5	
SM-1c	Y	10:29:00 AM	0.0	0.0	0.0	20.6	Garage Door Open
SM-2	Y	10:11:00 AM	0.0	0.0	0.0	20.4	Garage Door Open
SM-3	Y	10:00:00 AM	0.0	0.0	0.1	20.3	Garage Door Open
MW-12	Y	10:06:00 AM	0.0	0.0	0.1	20.3	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS | **Date: May 30, 2013**
Weather Conditions: Partly Cloudy 59% Humidity | **Ambient Temp: 72°**
Atmospheric Pressure: 27.39" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+ | **Serial #: 11944**
Factory Calibration Date: September 27, 2012 | **Field Calibration Date : May 30, 2013**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:57:00 PM	1378.0	68.9	21.3	0.2	1st reading since December
MM-2	Y	13:03:00 PM	1292.0	64.6	34.9	0.2	
MM-3	Y	13:09:00 PM	1168.0	58.4	35.6	0.2	Cover hasp difficult to open/close
MM-4	Y	13:18:00 PM	522.0	26.1	16.9	0.2	
MM-5	Y	13:23:00 PM	0.0	0.0	11.3	6.1	
MM-6	Y	13:31:00 PM	616.0	30.8	12.5	0.1	
MM-7	Y	12:22:00 PM	0.0	0.0	3.3	16.0	
MM-8	Y	12:16:00 PM	0.0	0.0	4.8	15.5	
MM-9	Y	12:00:00 PM	0.0	0.0	4.6	13.9	
MM-10	Y	11:53:00 AM	0.0	0.0	18.1	4.3	
MM-11	Y	11:43:00 AM	946.0	47.3	31.4	0.1	
MM-12	Y	11:34:00 AM	1248.0	62.4	32.4	0.1	
MM-13	Y	11:27:00 AM	28.0	1.4	14.3	1.0	
SM-1a	Y	12:31:00 PM	0.0	0.0	0.0	20.5	Garage Door Open
SM-1b	Y	12:25:00 PM	0.0	0.0	0.0	20.3	
SM-1c	Y	12:27:00 PM	0.0	0.0	0.0	20.5	Garage Door Open
SM-2	Y	12:12:00 PM	0.0	0.0	0.0	20.1	Garage Door Open
SM-3	Y	12:08:00 PM	0.0	0.0	0.0	20.1	
MW-12	Y	12:04:00 PM	0.0	0.0	0.0	19.7	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Partly Cloudy 57% Humidity
Atmospheric Pressure: 26.96" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 27, 2012

Date: June 30, 2013
Ambient Temp: 73°

Serial #: 11944
Field Calibration Date : June 30, 2013

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	12:57:00 PM	1420.0	71.0	28.8	0.1	
MM-2	Y	12:51:00 PM	1254.0	62.7	37.1	0.1	
MM-3	Y	12:40:00 PM	1152.0	57.6	38.7	0.1	Cover hasp difficult to open/close
MM-4	Y	12:32:00 PM	856.0	42.8	20.9	0.1	
MM-5	Y	12:23:00 PM	0.0	0.0	3.7	17.7	
MM-6	Y	12:11:00 PM	540.0	27.0	13.8	0.1	
MM-7	Y	11:51:00 AM	0.0	0.0	3.8	15.6	
MM-8	Y	11:44:00 AM	0.0	0.0	6.2	13.9	
MM-9	Y	11:36:00 AM	0.0	0.0	5.4	13.9	
MM-10	Y	11:30:00 AM	2.0	0.1	24.0	0.3	
MM-11	Y	11:19:00 AM	1022.0	51.1	34.0	0.1	
MM-12	Y	11:09:00 AM	1206.0	60.3	39.6	0.0	
MM-13	Y	11:00:00 AM	18.0	0.9	17.2	0.1	
SM-1a	Y	10:34:00 AM	0.0	0.0	0.0	20.2	
SM-1b	Y	10:30:00 AM	0.0	0.0	0.1	20.3	
SM-1c	Y	10:27:00 AM	0.0	0.0	0.0	20.3	
SM-2	Y	10:39:00 AM	0.0	0.0	0.0	20.2	
SM-3	Y	10:45:00 AM	0.0	0.0	0.0	20.2	
MW-12	Y	11:40:00 AM	0.0	0.0	0.0	20.1	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: July 29, 2013**
Weather Conditions: Sunny & Partly Cloudy 37% Humid Ambient Temp: 80°
Atmospheric Pressure: 27.33" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+ **Serial #: 11944**
Factory Calibration Date: September 27, 2012 **Field Calibration Date : July 29, 2013**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	17:23:00 PM	12.0	0.6	0.9	19.9	Well appears to be watered in.
MM-2	Y	17:16:00 PM	1270.0	63.5	36.2	0.2	
MM-3	Y	17:31:00 PM	1142.0	57.1	39.6	0.2	Cover hasp difficult to open/close
MM-4	Y	17:41:00 PM	476.0	23.8	21.0	1.2	
MM-5	Y	17:48:00 PM	22.0	1.1	9.4	4.7	
MM-6	Y	17:55:00 PM	568.0	28.4	14.3	0.1	
MM-7	Y	18:08:00 PM	0.0	0.0	4.3	14.3	
MM-8	Y	18:15:00 PM	0.0	0.0	6.5	12.5	
MM-9	Y	18:20:00 PM	0.0	0.0	5.4	13.1	
MM-10	Y	13:09:00 PM	38.0	1.9	24.0	0.1	
MM-11	Y	13:00:00 PM	1046.0	52.3	33.9	0.1	
MM-12	Y	12:49:00 PM	1232.0	61.6	37.4	0.1	
MM-13	Y	12:42:00 PM	76.0	3.8	17.2	0.1	
SM-1a	Y	13:42:00 PM	0.0	0.0	0.0	20.1	Garage Doors Open.
SM-1b	Y	13:37:00 PM	0.0	0.0	0.0	20.1	
SM-1c	Y	13:27:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
SM-2	Y	13:23:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
SM-3	Y	13:32:00 PM	0.0	0.0	0.0	20.0	
MW-12	Y	18:24:00 PM	0.0	0.0	0.0	20.0	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS **Date: August 28, 2013**
Weather Conditions: Sunny & Partly Cloudy 58% Humidity **Ambient Temp: 79°**
Atmospheric Pressure: 27.21" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+ **Serial #: 11944**
Factory Calibration Date: September 27, 2012 **Field Calibration Date: August 28, 2013**

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	16:29:00 PM	1394.0	69.7	29.9	0.1	
MM-2	Y	16:35:00 PM	1242.0	62.1	37.7	0.2	
MM-3	Y	16:43:00 PM	1160.0	58.0	39.7	0.1	Cover hasp difficult to open/close
MM-4	Y	16:50:00 PM	944.0	47.2	24.1	0.1	
MM-5	Y	16:54:00 PM	0.0	0.0	14.0	4.2	
MM-6	Y	17:02:00 PM	602.0	30.1	15.5	0.0	
MM-7	Y	15:22:00 PM	0.0	0.0	6.5	12.4	
MM-8	Y	16:16:00 PM	0.0	0.0	7.7	13	
MM-9	Y	15:34:00 PM	0.0	0.0	6.7	12.6	
MM-10	Y	16:08:00 PM	4.0	0.2	24.1	0.1	
MM-11	Y	15:59:00 PM	972.0	48.6	33.0	0.1	
MM-12	Y	15:52:00 PM	1226.0	61.3	38.2	0.1	
MM-13	Y	15:45:00 PM	52.0	2.6	17.7	0.2	
SM-1a	Y	15:08:00 PM	0.0	0.0	0.0	20.3	Garage Doors Open.
SM-1b	Y	15:01:00 PM	0.0	0.0	0.0	20.3	
SM-1c	Y	15:05:00 PM	0.0	0.0	0.0	20.3	Garage Doors Open.
SM-2	Y	15:12:00 PM	0.0	0.0	0.0	20.3	Garage Doors Open.
SM-3	Y	15:27:00 PM	0.0	0.0	0.0	20.2	
MW-12	Y	15:30:00 PM	0.0	0.0	0.0	20.3	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Cloudy 68% Humidity
Atmospheric Pressure: 27.10" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 18, 2013

Date: September 26, 2013
Ambient Temp: 67°

Serial #: 11944
Field Calibration Date : September 26, 2013

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	15:47:00 PM	1324.0	66.2	33.3	0.4	
MM-2	Y	15:53:00 PM	1240.0	62.0	37.8	0.1	
MM-3	Y	15:59:00 PM	1174.0	58.7	39.4	0.1	Cover hasp difficult to open/close
MM-4	Y	16:08:00 PM	986.0	49.3	26.6	0.1	
MM-5	Y	16:13:00 PM	0.0	0.0	4.6	15.4	
MM-6	Y	16:20:00 PM	492.0	24.6	15.5	0.1	
MM-7	Y	14:51:00 PM	0.0	0.0	6.7	13.1	
MM-8	Y	14:43:00 PM	0.0	0.0	6.1	15	
MM-9	Y	14:35:00 PM	0.0	0.0	5.0	16.3	
MM-10	Y	15:05:00 PM	0.0	0.0	22.8	0.9	
MM-11	Y	15:13:00 PM	976.0	48.8	34.7	0.1	
MM-12	Y	15:22:00 PM	1232.0	61.6	38.1	0.1	
MM-13	Y	15:31:00 PM	6.0	0.3	18.4	0.2	
SM-1a	Y	14:24:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
SM-1b	Y	14:20:00 PM	0.0	0.0	0.0	20.0	
SM-1c	Y	14:22:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
SM-2	Y	14:27:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
SM-3	Y	14:33:00 PM	0.0	0.0	0.0	20.0	
MW-12	Y	14:38:00 PM	0.0	0.0	0.0	20.0	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Sunny 44% Humidity
Atmospheric Pressure: 26.85" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 18, 2013

Date: November 01, 2013
Ambient Temp: 65°

Serial #: 11944
Field Calibration Date : November 01, 2013

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	Y	16:07:00 PM	1300.0	65.0	34.8	0.1	
MM-2	Y	16:13:00 PM	1242.0	62.1	37.7	0.1	
MM-3	Y	16:19:00 PM	1134.0	56.7	37.8	0.2	Cover hasp difficult to open/close
MM-4	Y	16:27:00 PM	754.0	37.7	27.7	0.1	
MM-5	Y	16:33:00 PM	0.0	0.0	2.6	18.1	
MM-6	Y	16:39:00 PM	338.0	16.9	15.0	0.1	
MM-7	Y	14:28:00 PM	0.0	0.0	6.4	14.1	
MM-8	Y	14:19:00 PM	0.0	0.0	5.3	16.1	
MM-9	Y	14:11:00 PM	0.0	0.0	6.9	14.3	
MM-10	Y	14:40:00 PM	148.0	7.4	24.2	0.1	
MM-11	Y	14:50:00 PM	896.0	44.8	33.2	0.1	
MM-12	Y	15:00:00 PM	1234.0	61.7	38.0	0.1	
MM-13	Y	15:12:00 PM	0.0	0.0	16.2	2.2	
SM-1a	Y	13:52:00 PM	0.0	0.0	0.0	19.9	Garage Doors Open.
SM-1b	Y	13:55:00 PM	0.0	0.0	0.1	19.8	
SM-1c	Y	13:58:00 PM	0.0	0.0	0.0	19.9	Garage Doors Open.
SM-2	Y	14:00:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
SM-3	Y	14:04:00 PM	0.0	0.0	0.0	20.0	Garage Doors Open.
MW-12	Y	14:13:00 PM	0.0	0.0	0.0	20.0	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

Name of Person Taking Readings: RS
Weather Conditions: Partly Cloudy 66% Humidity
Atmospheric Pressure: 26.94" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+
Factory Calibration Date: September 18, 2013

Date: December 02, 2013
Ambient Temp: 45°

Serial #: 11944
Field Calibration Date: December 02, 2013

Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	N	13:26:00 PM	1104.0	55.2	31.6	1.6	Copied highest CH4 levels. Well is full of water.
MM-2	Y	13:33:00 PM	1272.0	63.6	36.2	0.1	
MM-3	Y	13:41:00 PM	952.0	47.6	35.4	0.1	Cover hasp difficult to open/close
MM-4	Y	13:50:00 PM	518.0	25.9	27.0	0.1	
MM-5	Y	13:55:00 PM	2.0	0.1	2.0	18.9	
MM-6	Y	16:02:00 PM	184.0	9.2	13.4	0.1	
MM-7	Y	12:57:00 PM	0.0	0.0	5.9	15.2	
MM-8	Y	12:49:00 PM	0.0	0.0	4.9	16.9	
MM-9	Y	12:36:00 PM	0.0	0.0	7.6	13.7	
MM-10	Y	12:24:00 PM	0.0	0.0	21.1	1.4	
MM-11	Y	12:13:00 PM	822.0	41.1	32.5	0.0	
MM-12	Y	12:05:00 PM	1248.0	62.4	37.4	0.1	
MM-13	Y	11:56:00 AM	0.0	0.0	14.5	2.8	
SM-1a	Y	13:09:00 PM	0.0	0.0	0.1	20.8	
SM-1b	Y	13:00:00 PM	0.0	0.0	0.1	20.8	
SM-1c	Y	13:03:00 PM	0.0	0.0	0.1	20.7	
SM-2	Y	12:44:00 PM	0.0	0.0	0.1	20.7	Garage Doors Open.
SM-3	Y	12:31:00 PM	0.0	0.0	0.1	20.7	
MW-12	Y	12:39:00 PM	0.0	0.0	0.1	20.7	

Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

ASSESSMENT MONITORING

Landfill Gas Measurements Field Worksheet
Francis Farm Landfill - Permit #44-03
Haywood County, North Carolina

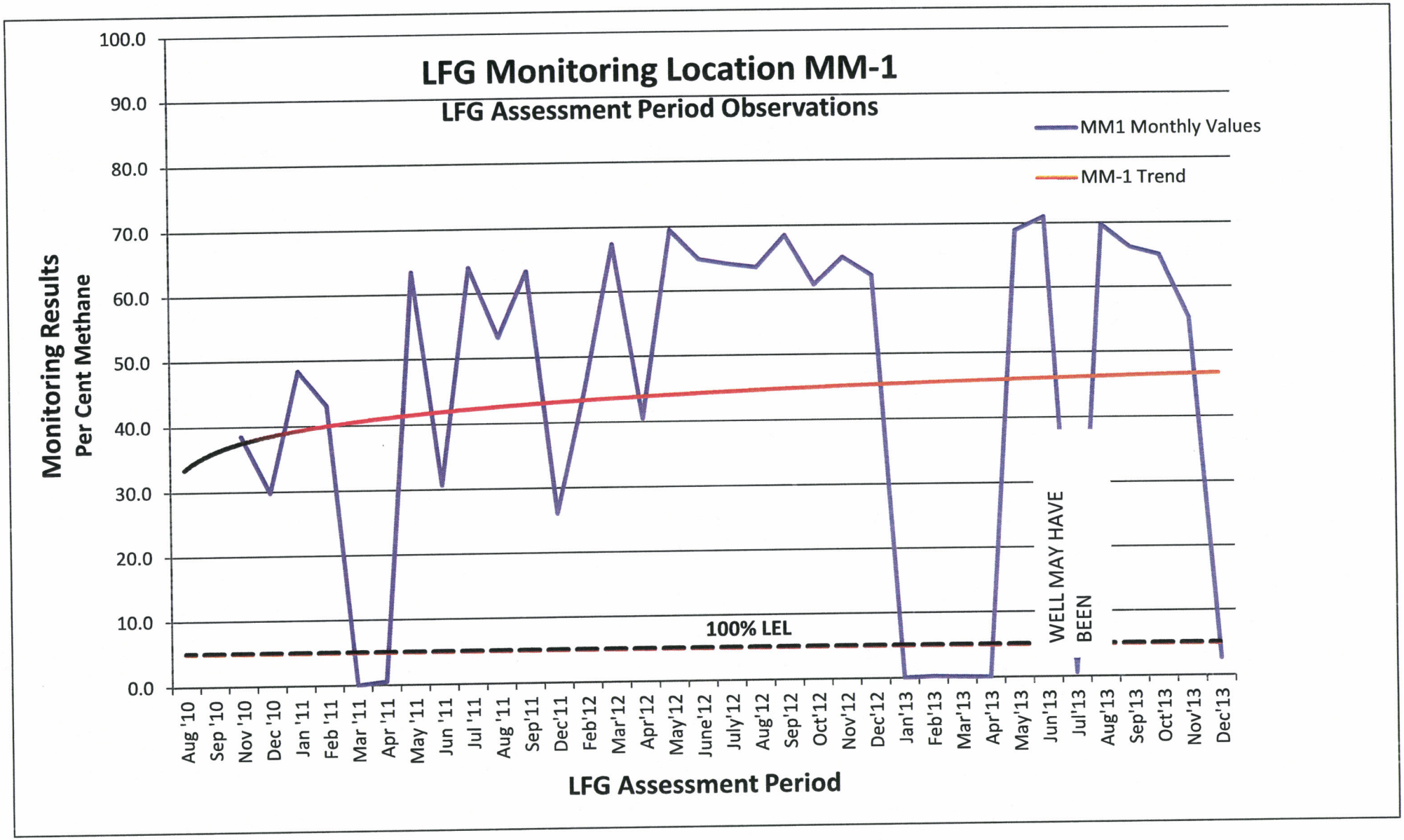
Name of Person Taking Readings: RS **Date: January 02, 2014**
Weather Conditions: Light Precipitation 81% Humidity **Ambient Temp: 44°**
Atmospheric Pressure: 26.91" Hg
Gas Monitoring Equipment: Land-Tec GEM 2000+ **Serial #: 11944**
Factory Calibration Date: September 18, 2013 **Field Calibration Date : January 02, 2014**

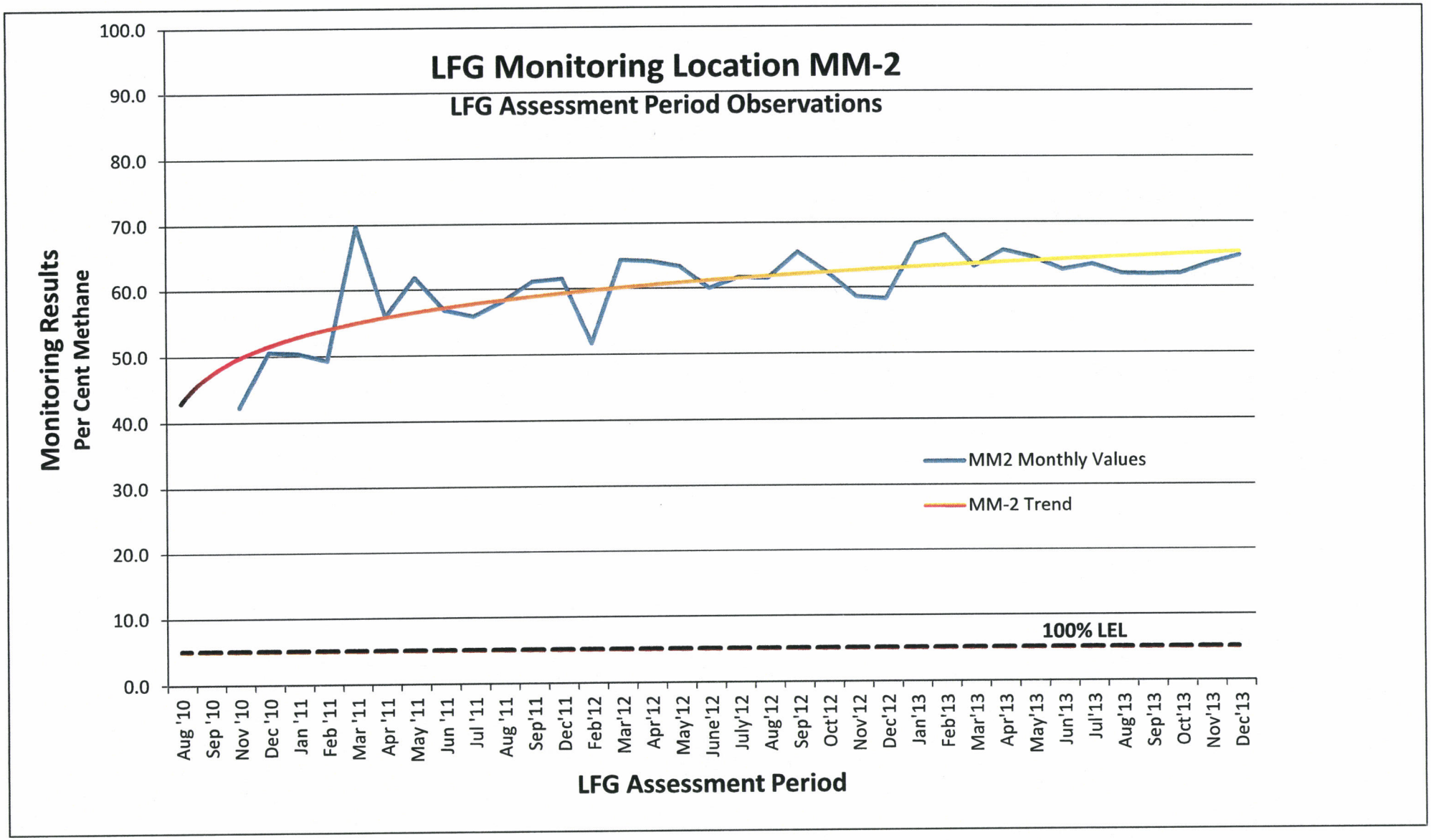
Well or Probe ID	Stable Readings	Time	%LEL	$\%CH_4$	$\%CO_2$	$\%O_2$	Notes:
MM-1	N	11:16:00 AM	52.0	2.6	5.9	18.9	Copied highest CH4 levels. Well is full of water.
MM-2	Y	11:23:00 AM	1296.0	64.8	35.0	0.1	
MM-3	Y	11:31:00 AM	1150.0	57.5	35.1	0.1	Cover hasp difficult to open/close
MM-4	Y	11:40:00 AM	232.0	11.6	21.8	1.6	
MM-5	Y	11:48:00 AM	0.0	0.0	0.3	20.2	
MM-6	Y	11:55:00 AM	238.0	11.9	13.2	0.0	
MM-7	Y	10:59:00 AM	0.0	0.0	6.3	13.2	
MM-8	Y	10:47:00 AM	0.0	0.0	4.5	16	
MM-9	Y	10:33:00 AM	0.0	0.0	4.9	15.2	
MM-10	Y	10:23:00 AM	0.0	0.0	15.9	7.6	
MM-11	Y	10:12:00 AM	846.0	42.3	31.7	0.0	
MM-12	Y	10:01:00 AM	1252.0	62.6	37.2	0.0	
MM-13	Y	9:52:00 AM	40.0	2.0	15.0	0.0	
SM-1a	Y	11:02:00 AM	0.0	0.0	0.1	20.4	Garage Doors Open.
SM-1b	Y	11:04:00 AM	0.0	0.0	0.1	20.4	
SM-1c	Y	11:07:00 AM	0.0	0.0	0.1	20.4	
SM-2	Y	10:42:00 AM	0.0	0.0	0.1	20.3	Garage Doors Open.
SM-3	Y	10:29:00 AM	0.0	0.0	0.1	20.2	Garage Doors Open.
MW-12	Y	10:36:00 AM	0.0	0.0	0.1	20.3	

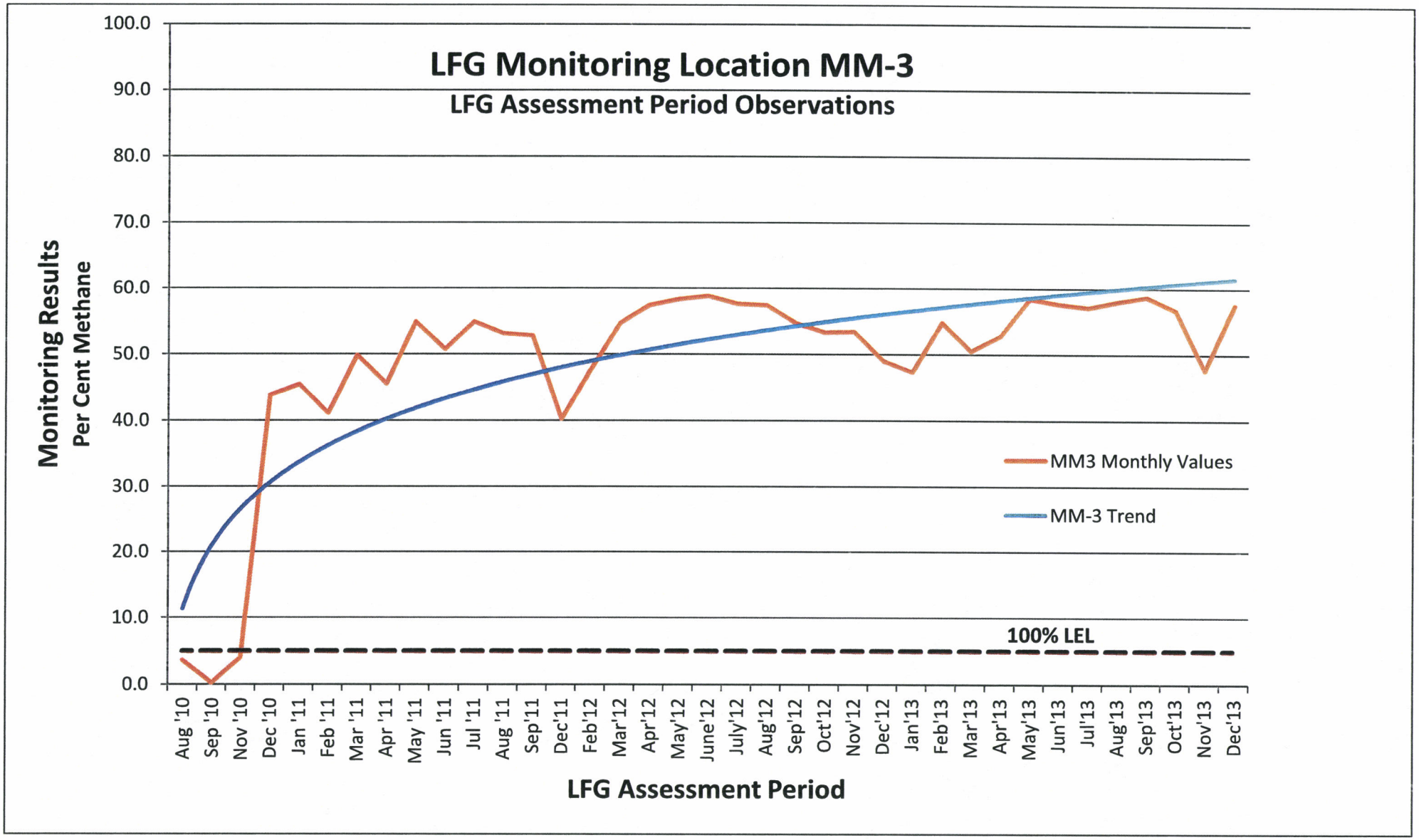
Note: If methane gas readings exceed 25% of LEL in structures or 100% of LEL in probes contact Haywood County Solid Waste Director immediately at 828-400-3544.

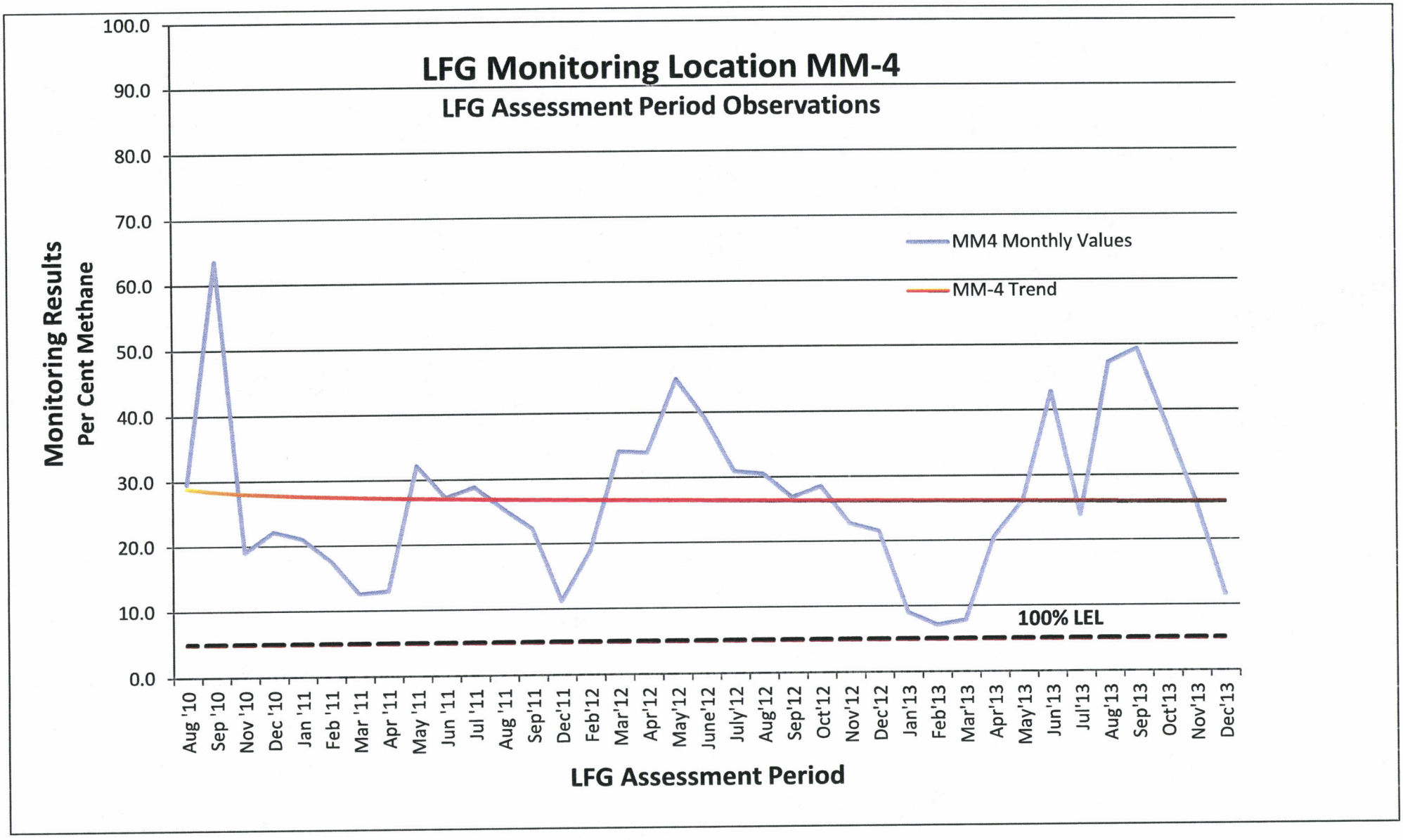
APPENDIX 3

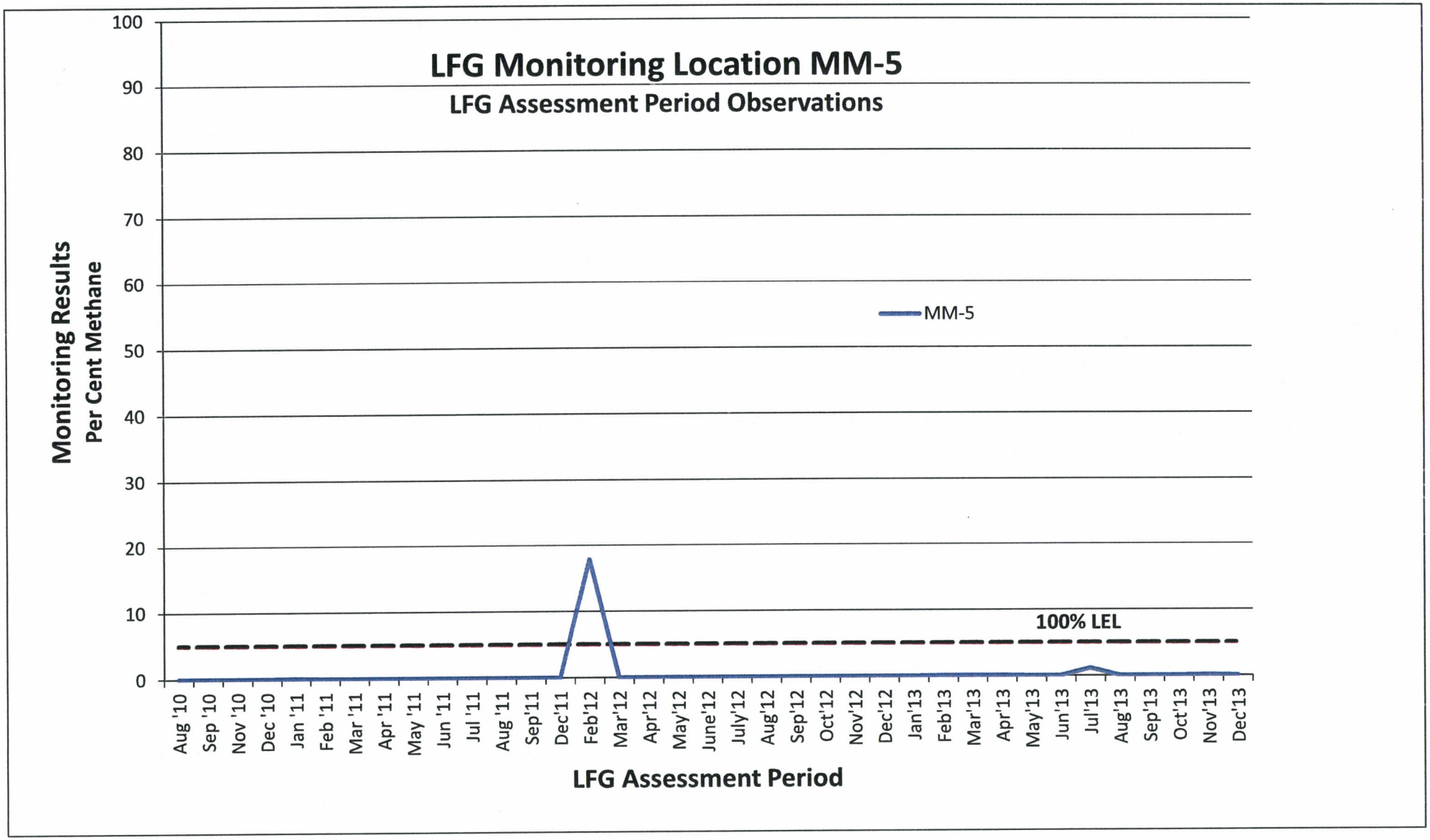
Trend Analysis of Methane Monitoring Locations Exceeding 100% LEL


LFG Monitoring Location MM-1
LFG Assessment Period Observations
MM1 Monthly Values
MM-1 Trend
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
100% LEL
WELL MAY HAVE
BEEN
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
June'12
July'12
Aug'12
Sep'12
Oct'12
Nov'12
Dec'12
Jan'13
Feb'13
Mar'13
Apr'13
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-2
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MM2 Monthly Values
MM-2 Trend
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
June'12
July'12
Aug'12
Sep'12
Oct'12
Nov'12
Dec'12
Jan'13
Feb'13
Mar'13
Apr'13
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-3
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MM3 Monthly Values
MM-3 Trend
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
June'12
July'12
Aug'12
Sep'12
Oct'12
Nov'12
Dec'12
Jan'13
Feb'13
Mar'13
Apr'13
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-4
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MM4 Monthly Values
MM-4 Trend
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
June'12
July'12
Aug'12
Sep'12
Oct'12
Nov'12
Dec'12
Jan'13
Feb'13
Mar'13
Apr'13
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-5
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100
90
80
70
60
50
40
30
20
10
0
MM-5
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
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July'12
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Sep'12
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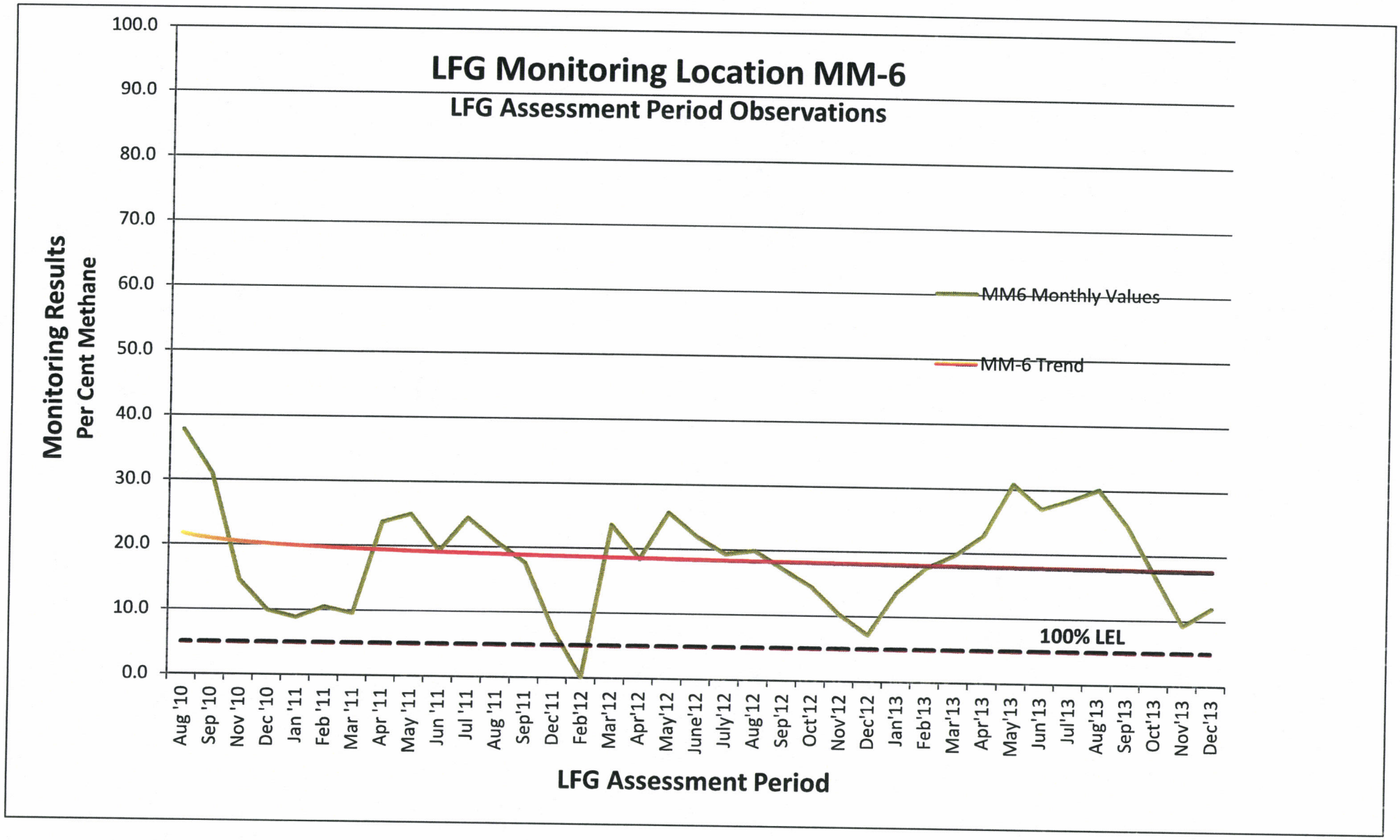
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-6
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MM6 Monthly Values
MM-6 Trend
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
June'12
July'12
Aug'12
Sep'12
Oct'12
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Jan'13
Feb'13
Mar'13
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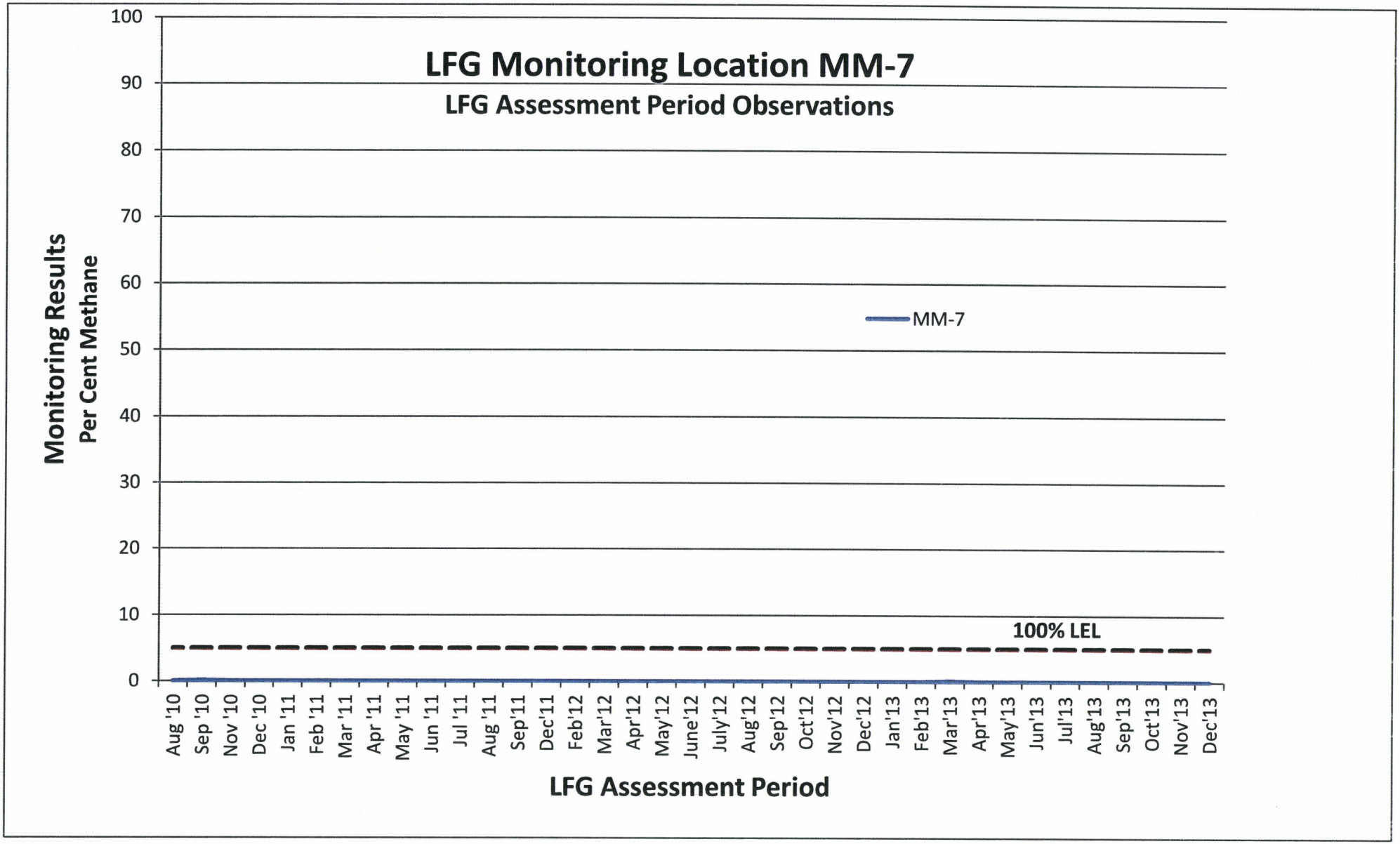
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-7
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100
90
80
70
60
50
40
30
20
10
0
MM-7
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
May'12
June'12
July'12
Aug'12
Sep'12
Oct'12
Nov'12
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Jan'13
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Mar'13
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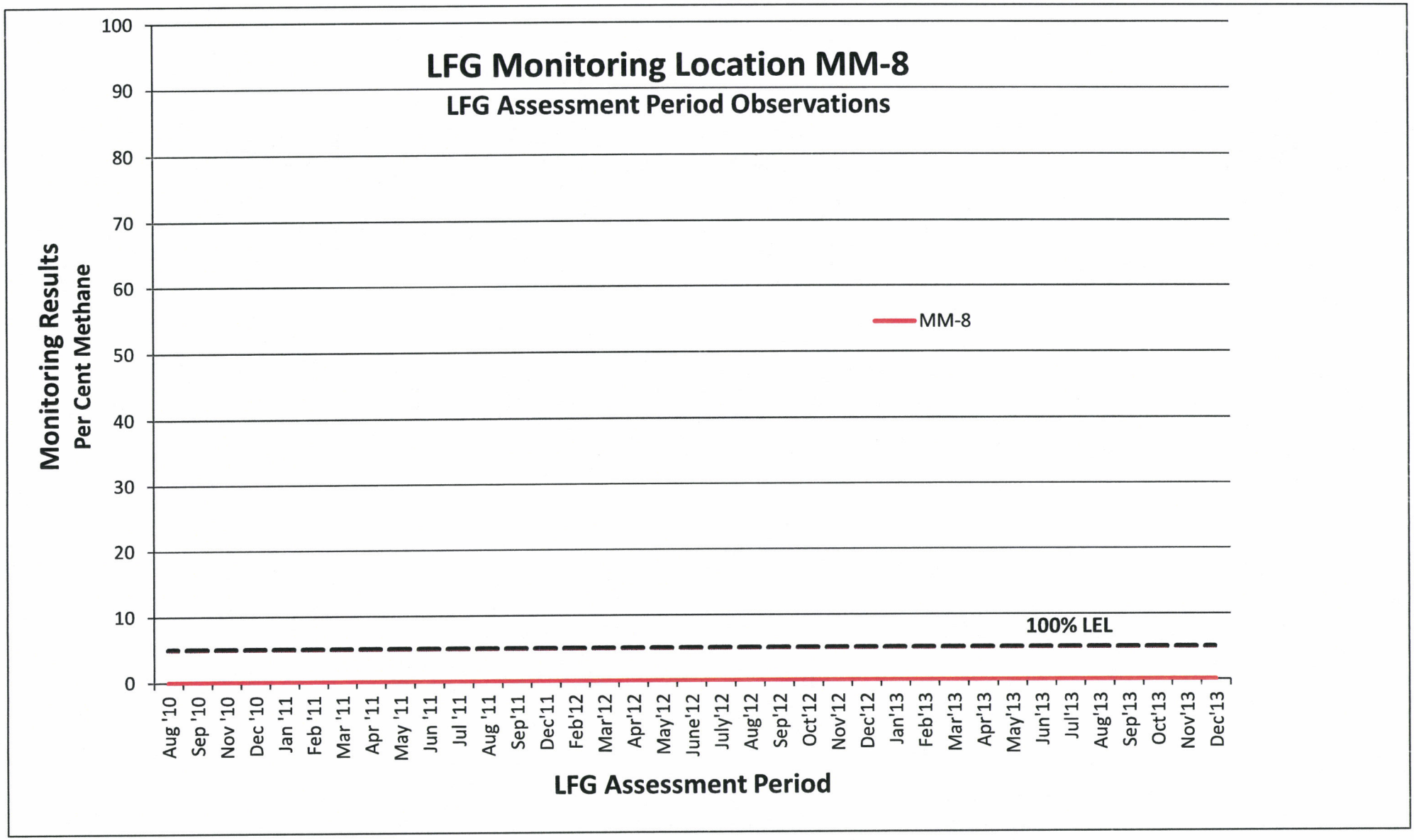
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-8
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100
90
80
70
60
50
40
30
20
10
0
MM-8
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
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July'12
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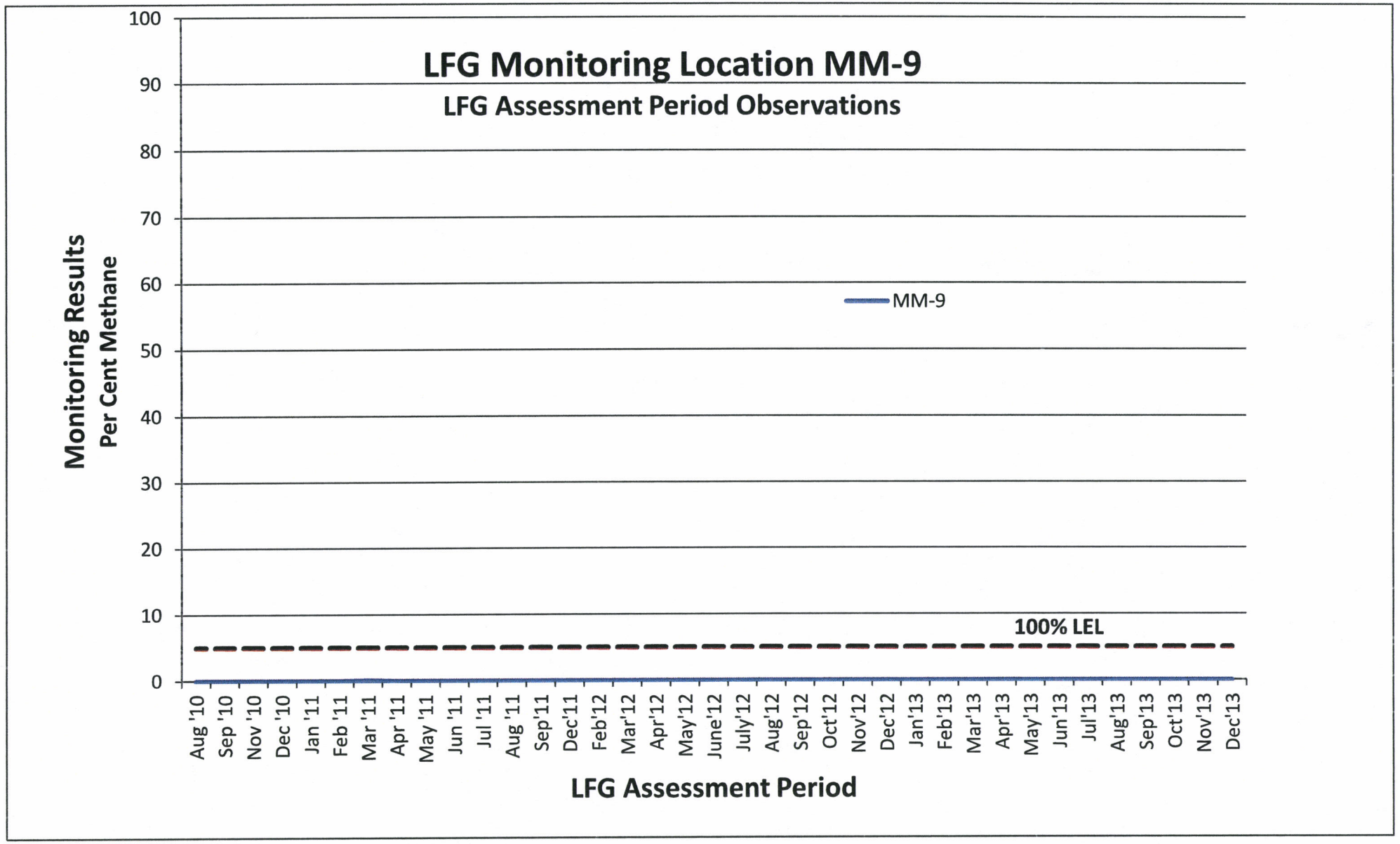
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-9
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100
90
80
70
60
50
40
30
20
10
0
MM-9
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
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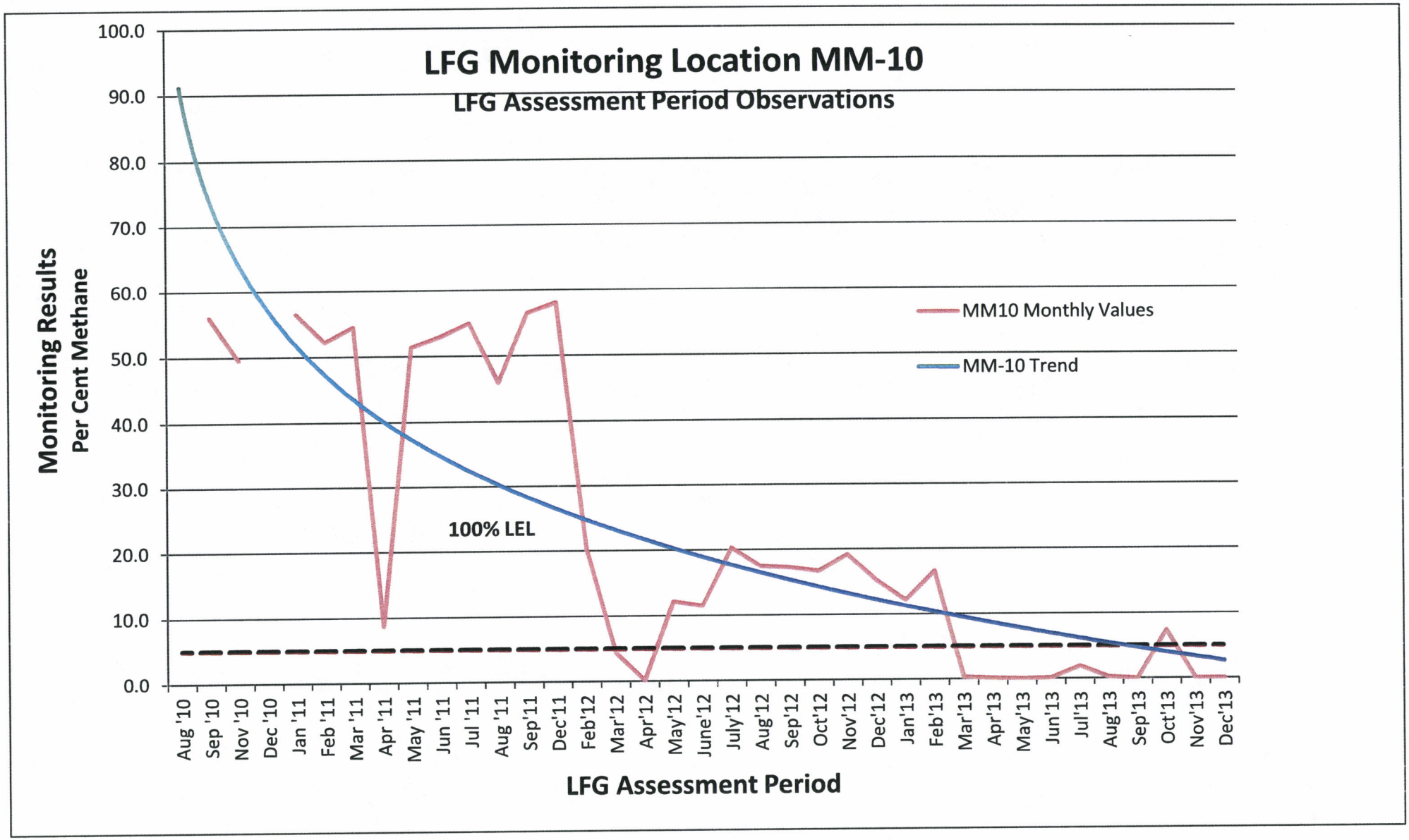
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-10
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MM10 Monthly Values
MM-10 Trend
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
Apr'12
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June'12
July'12
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Mar'13
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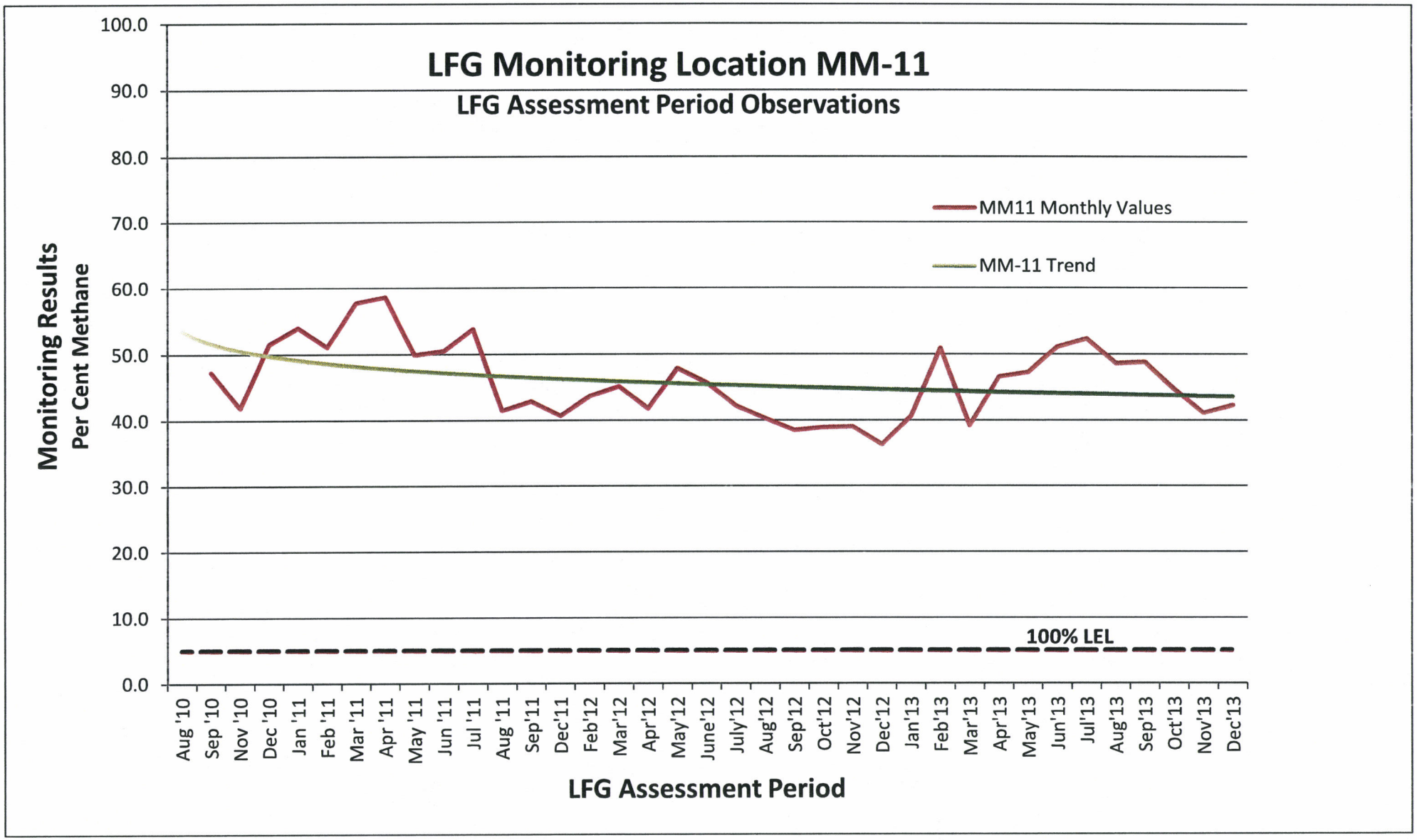
May'13
Jun'13
Jul'13
Aug'13
Sep'13
Oct'13
Nov'13
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-11
LFG Assessment Period Observations
MM11 Monthly Values
MM-11 Trend
100% LEL
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
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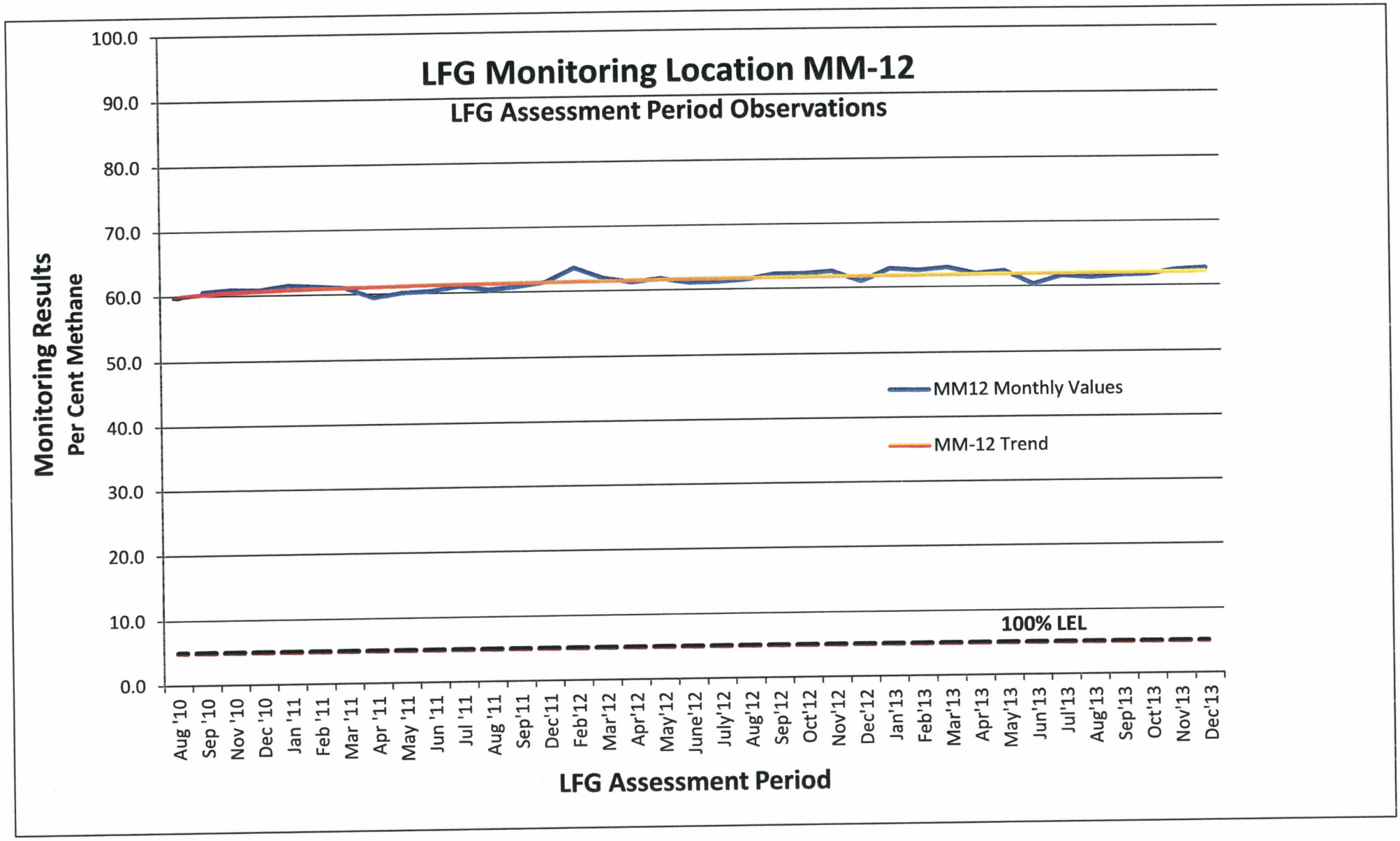
Dec'13
LFG Assessment Period


LFG Monitoring Location MM-12
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
MM12 Monthly Values
MM-12 Trend
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
Apr '11
May '11
Jun '11
Jul '11
Aug '11
Sep'11
Dec'11
Feb'12
Mar'12
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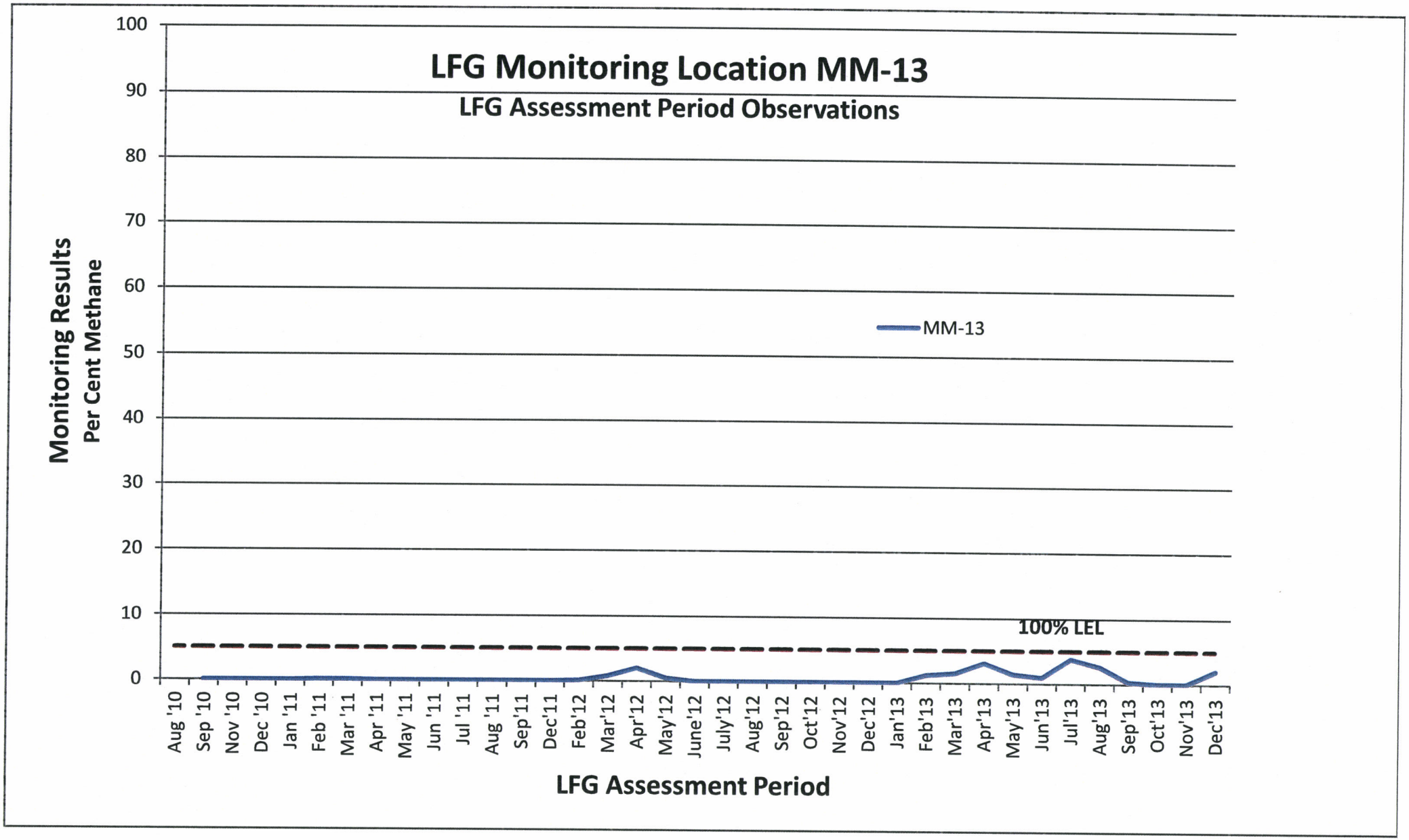
LFG Assessment Period


LFG Monitoring Location MM-13
LFG Assessment Period Observations
Monitoring Results
Per Cent Methane
100
90
80
70
60
50
40
30
20
10
0
MM-13
100% LEL
Aug '10
Sep '10
Nov '10
Dec '10
Jan '11
Feb '11
Mar '11
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Aug '11
Sep'11
Dec'11
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Dec'13
LFG Assessment Period

CONNECTION POINT FROM GENERATOR TO HAYWOOD EMC ELECTRICAL GRID
LEACHATE PUMP STATION
CONDENSATE SUMP
2" PVC SDR 13.5 FORCE MAIN
HDPE LEACHATE COLLECTION PIPE
HDPE METHANE COLLECTION PIPE
PROPERTY LINE (APPROXIMATE ONLY)
SEWER CONNECTION POINT TO TOWN OF WAYNESVILLE SEWER SYSTEM
ELECTRICAL GENERATOR
LANDFILL GAS FLARE STATION
EXISTING BURIED O.C. (APPROXIMATE LOCATION ONLY)
EXISTING O.H. TELEPHONE LINE
EXISTING 24" CMP RISER PIPE TOP ELEV.: 2704.62 INV. OUT: 2697.60
EXISTING RIPRAP DITCH
EXISTING SEDIMENT CONTROL STRUCTURE TO REMAIN IN SERVICE
LANDFILL GAS EXTRACTION WELL
HDPE LEACHATE COLLECTION PIPE
APPROXIMATE WASTE LIMITS
MARKER POST, TYP.
HDPE LANDFILL GAS COLLECTION PIPE
PROPERTY LINE (APPROXIMATE ONLY)
EXISTING GROUNDWATER MW-12 TO BE REMOVED FROM LFG MONITORING NETWORK

RATCLIFFE COVE BRANCH
FRANCIS FARM ROAD S.R. 1802
FARMVIEW DRIVE SR 1945
ASPHALT
GRAVEL
CONCRETE
MAINTENANCE BUS GARAGE
MAINTENANCE STORAGE
EQUIPMENT STORAGE
SHOOTING RANGE ACCESS ROAD
POWER LINE (APPROX. LOCATION ONLY)

LEWIS, BETTY F
08A8626239678

HAYWOOD COUNTY CONSOLIDATED SCHOOL SYSTEM
8626-22-2037

HAYWOOD COUNTY CONSOLIDATED SCHOOL SYSTEM
8626-21-0478

HAYWOOD COUNTY CONSOLIDATED SCHOOL SYSTEM
8626-21-0478

SHELTON, CLARENCE ALAN
SHELTON, VICKY
08A8626217591

STEPHENS, ELAINE FRANCIS TR
ELAINE FRANCIS STEPHENS REV TR
08A8626115397

FRANCIS, JAMES HARLEY
STEPHENS, ELAINE F
08A8626110956

FRANCIS, JAMES HARLEY
STEPHENS, ELAINE F
08A8626111287

CARPENTER FAMILY REV TRUST
08A8626216061

STEPHENS, ELAINE FRANCIS TR
ELAINE FRANCIS STEPHENS REV TR
08A8626200863

PRIVATE RESIDENCE

MW-1A, MW-1, MW-8, MW-9, MW-10, MW-15, MW-18, MW-24, MW-3A, MW-14, MW-14D, MW-16, MW-16D, MW-13, MW-4, MW-25, MW-11, MW-5, MW-21, MW-12, MW-17
MM-1, MM-2, MM-3, MM-4, MM-5, MM-6, MM-7, MM-8, MM-9, MM-10, MM-11, MM-12, MM-13
EW-1, EW-2, EW-3, EW-4, EW-5, EW-6, EW-7, EW-8, EW-9, EW-10, EW-11, EW-12, EW-13, EW-14, EW-15, EW-16, EW-17, EW-18, EW-19, EW-20, EW-21
SM-1a, SM-1b, SM-1c, SM-2, SM-3

NOTES:

1. PROPERTY LINES SHOWN ARE FROM HAYWOOD COUNTY G.I.S. DEPARTMENT, AND ARE APPROXIMATE ONLY.
2. CONTOURS ON FRANCIS FARM LANDFILL SOUTH AND WEST OF PAVED ACCESS ROAD AND ALONG FARMVIEW DRIVE ARE FROM GROUND SURVEY PERFORMED BY McGILL ASSOCIATES, OCTOBER 2009 & FEBRUARY 2011. REMAINING CONTOURS ARE LIDAR CONTOURS PROVIDED BY HAYWOOD COUNTY.
3. SURVEY CONTROL INFORMATION BASED ON NAVD 88 AND NAD83 (NCRS 2007).

LEGEND

- MW-13 — GROUND WATER MONITORING WELL
- MM-1 — LANDFILL GAS MONITORING WELL
- SM-1a — LANDFILL GAS MONITORING LOCATION IN STRUCTURE
- EW-1 — LANDFILL GAS EXTRACTION WELL
- LANDFILL GAS EXTRACTION WELL WITH LEACHATE PUMP
- 4" — HDPE LANDFILL GAS COLLECTION PIPE, WITH PIPE SIZE
- 4" — HDPE LEACHATE COLLECTION PIPE, WITH PIPE SIZE
- APPROXIMATE WASTE LIMITS
- FRANCIS FARM LANDFILL PROPERTY LINE
- ADJOINING PROPERTY LINE

PLAN
GRAPHIC SCALE 80 0 40 80 160 240 — 1 INCH = 80 FEET

NO.	DATE	BY	REVISION DESCRIPTION

McGill ASSOCIATES
ENGINEERING.PLANNING.FINANCE
55 BROAD STREET ASHEVILLE, NC 28801 PH. (828) 252-0575 FIRM LICENSE # C-0459

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 39263 DAVID C. PAYNE

REVIEWED

FRANCIS FARM LANDFILL
REPORT OF LFG ASSESSMENT
OCTOBER 2010 THROUGH DECEMBER 2014
HAYWOOD COUNTY
HAYWOOD COUNTY, NORTH CAROLINA

JOB NO.: 10.00726
DATE: JANUARY 2014
DESIGNED BY: DP
CADD BY: DP
DESIGN REVIEW: ____
CONST. REVIEW: ____
FILE NAME: Report of Landfill Gas Assessment Figure 1.dwg

LFG MONITORING SITE PLAN

FIGURE 1

Q:\2010\10.00726\Design\Solid Waste\Drawings\Report of LFG Assessment January 2014\Report of Landfill Gas Assessment Figure 1.dwg 1/31/2014 3:01 PM DAVE