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SCS ENGINEERS

April 27, 2016
File No. 09214113.04

Mr. John Morris, P.G.
Florida Department of Environmental Protection
Southwest District Office – Solid Waste Section
13051 N. Telecom Parkway
Temple Terrace, FL, 33737-0926

Subject: **Landfill Gas Monitoring Report, Second Quarter 2016**
**Methane Perimeter Probes and Buildings Sampling**
**Lena Road Landfill, Manatee County, Florida**
**Permit # 39884-018-SO/01**

Dear Mr. Morris:

SCS Engineers (SCS) is pleased to submit the results of the second quarter of 2016 landfill gas (LFG) monitoring at Lena Road Landfill. Provided below is a description of our activities, summary of the monitoring results, and recommendations.

## BACKGROUND

At Lena Road Landfill, Stage I is currently not accepting waste and is closed, while Stage III contains the active area of the site. Currently, there is an active landfill gas (LFG) collection system encompassing both Stage I and Stage III, with vertical LFG extraction wells removing gas from the landfill.

Landfill gas probes are designed to monitor whether methane and other gases are migrating underground outside of the landfill area. There are 11 LFG monitoring probes located on site around the boundaries of the Lena Road Landfill. Attachment 1 is a site map showing the LFG monitoring probe locations. This quarterly monitoring was conducted in accordance with Rule 62-701.530(2)(c), F.A.C. per specific condition Part F-2 of the landfill's operations permit #39884-018-SO-01.

Additionally, rule 62-701.530(1)(a) of the Florida Administrative Code (F.A.C.) requires the following:

- The methane concentration may not exceed 25 percent of the lower explosive limit (LEL) in structures on- or off-site. The LEL for methane is five percent by volume in air. Therefore, the maximum allowable concentration in on-site or off-site structures is 1.25 percent methane by volume.

- The methane concentration at or beyond the landfill property boundary may not exceed the LEL (i.e., five percent (5.0%) methane by volume).

## MONITORING RESULTS

On April 20, 2016, SCS personnel monitored the LFG monitoring probes and on-site structures. SCS used a Landtec GEM-5000 gas monitor to measure gas composition in the monitoring probes and on-site structures. The GEM-5000 measures gas by percent volume of methane, carbon dioxide, oxygen, and balance gas, which is considered to be composed primarily of nitrogen. The instrument was calibrated prior to use during the sampling event and the calibration sheets are included in Attachment 3.

### LFG Monitoring Probes

Table 1 of Attachment 2 shows the readings obtained from the 11 probes along the property boundary, no methane was detected in the gas monitoring probes. A site plan showing the probe locations is included in Attachment 1.

### Monitoring of On-Site Structures

No methane was detected in the scale house, administration building, operations building, recycling building, or maintenance building as shown in Table 1 of Attachment 2. In the buildings, SCS monitored both restrooms, the offices, and main area. Readings were taken while walking around the buildings and interior rooms in a continuous manner.

## CONCLUSIONS

No methane was detected during this monitoring event in the 11 probes, which are the compliance points for migration, or within any of the buildings monitored on-site. The facility is thus in compliance with its operations permit for gas migration and monitoring.

Please call us at (813) 621-0080 if you have any questions or would like additional information.

Sincerely,

Wendell Stainsby, E.I.
Staff Professional
**SCS ENGINEERS**

Daniel R. Cooper, P.E.
Project Director
**SCS ENGINEERS**

DANIEL R. COOPER
LICENSE
No 66440
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

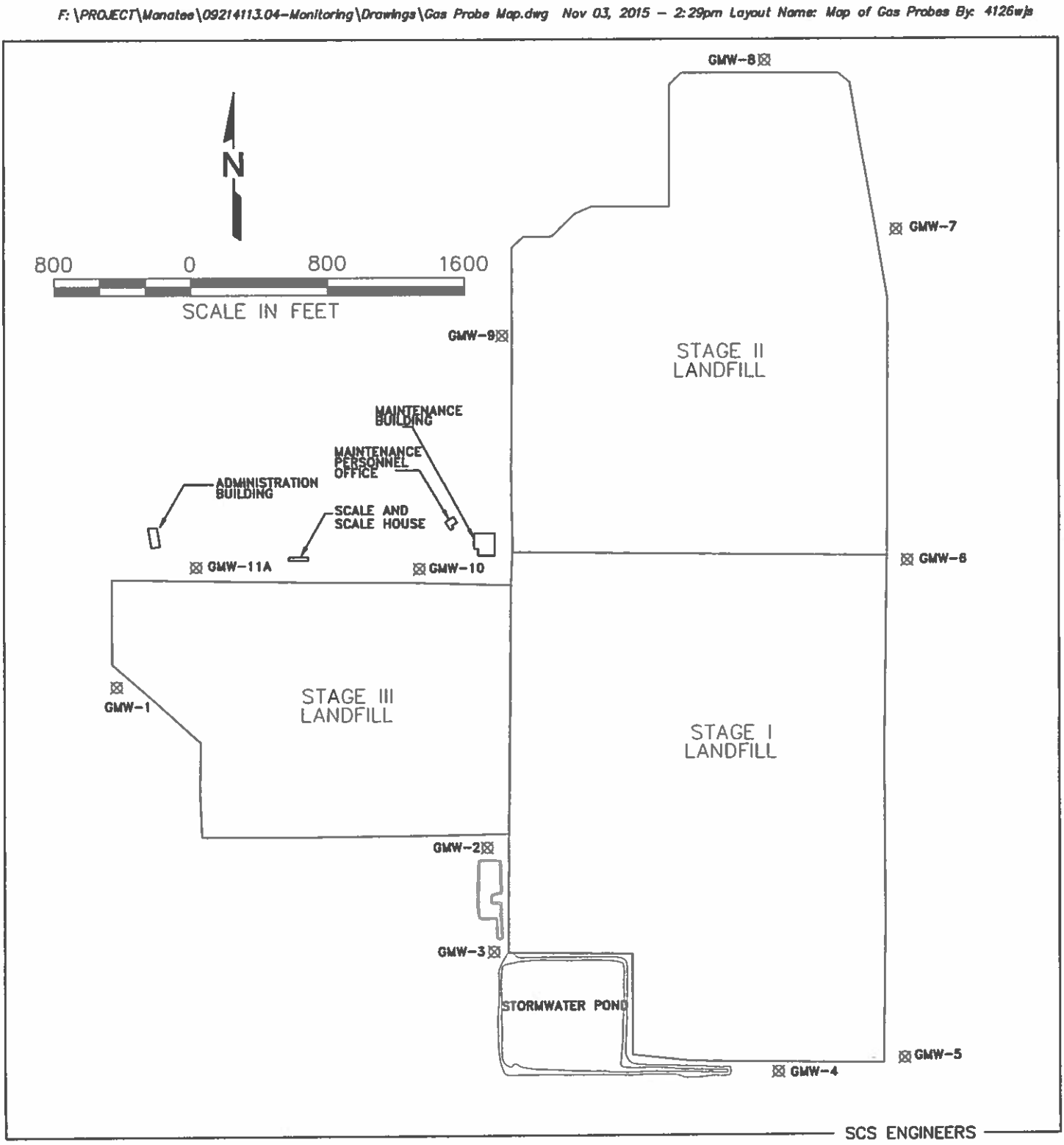
WJS/DRC: wjs

Attachment

cc: C. Mike Gore – Utilities Department Director, Manatee County (electronic)
Bryan White – Landfill Superintendent, Manatee County (electronic)
Anthony Detweiler – Operations Supervisor, Manatee County (electronic)
Lynette Falkowski – Administration, Manatee County (electronic)

# ATTACHMENT 1

# GAS PROBE LOCATIONS




Lena Road Landfill, Manatee County, Florida
Figure 1: Gas Monitoring Probes & Building Locations

# ATTACHMENT 2

# 2ND QUARTER PROBE/BUILDING MONITORING RESULTS

**ATTACHMENT 2**

**TABLE 1**

**LANDFILL GAS MIGRATION MONITORING, 2ND QUARTER 2016**

**LENA ROAD LANDFILL, MANATEE COUNTY, FLORIDA**

| Probe No. | $CH_4$ (%) | $CO_2$ (%) | $O_2$ (%) | Balance (%) | Comments |
|---|---|---|---|---|---|
| GMW-1 | 0.0 | 0.9 | 18.9 | 80.2 | |
| GMW-2 | 0.0 | 0.5 | 19.4 | 80.1 | |
| GMW-3 | 0.0 | 1.9 | 18.1 | 80.0 | |
| GMW-4 | 0.0 | 0.5 | 18.8 | 80.7 | |
| GMW-5 | 0.0 | 0.4 | 19.0 | 80.6 | |
| GMW-6 | 0.0 | 0.4 | 19.0 | 80.6 | |
| GMW-7 | 0.0 | 0.2 | 19.2 | 80.6 | |
| GMW-8 | 0.0 | 0.2 | 19.1 | 80.7 | |
| GMW-9A | 0.0 | 0.9 | 18.4 | 80.7 | |
| GMW-10 | 0.0 | 0.2 | 19.0 | 80.8 | |
| GMW-11A | 0.0 | 4.6 | 16.2 | 79.2 | |

| On Site | CH4 (%) | % LEL |
|---|---|---|
| Recycle Building | 0.0 | 0.0 |
| Recycle Building - Office | 0.0 | 0.0 |
| Scale House | 0.0 | 0.0 |
| Administration | 0.0 | 0.0 |
| Operations Bldg | 0.0 | 0.0 |
| Maintenance Bldg | 0.0 | 0.0 |

Notes:

1. Monitoring performed by SCS Engineers on: 4/20/2016
2. Temperature: 83 deg F
3. Barometric Pressure: 30.02 in. Hg

# ATTACHMENT 3

# GEM CALIBRATION SHEETS

## GEM-5000 Field Calibration Data Sheet

GEM-5000 Instrument Data

Instrument Serial No.: G500213
Technician Name: Wendell Stainsby, Jacob Smith
Date and Time: 4/20/2016 10:00am
Last Factory Calibration Date: February 10, 2016

Calibration Gas Manufacturer's Data

| | |
|---|---|
| Manufactured by: | Landtec |
| Manufactured date: | |
| Lot Number: | LAN-399-2 |
| Expiration Date: | March 2018 |

Prior to taking any measurements the instrument must undergo a full calibration according to manufacturer's instructions. This should then be followed by a calibration verification using ambient air and calibration gas to verify instrument performance prior to measurement.

Tabulated below are the acceptable gas concentrations that should be demonstrated when zeroing the instrument and calibrating the span gas concentrations.

| Zero Gas Composition | | | |
|---|---|---|---|
| $CH_4$ (%) | $CO_2$ (%) | $N_2$ (%) | $O_2$ (%) |
| 0.0 | 0.0 | 0.0 | 0.0 (Calibration Gas) |

| Span Gas Composition | | | |
|---|---|---|---|
| $CH_4$ (%) | $CO_2$ (%) | $N_2$ (%) | $O_2$ (%) |
| 50.0 | 35.0 | 15.0 | 0.0 |

**Calibration must be verified by conducting the following procedures:**

1) Turn on the instrument and allow it to run and purge with ambient air for 3 minutes and then record the gas concentration readings.
2) Apply calibration gas to the instrument, wait 1 minute for the readings to stabilize and then record the gas concentration readings.
3) Determine if the reading is within 10% of calibration gas concentration. If so indicate that the instrument "Passes" the field calibration for that gas.
4) If any of the sensors display a reading outside of the acceptable range, then a full manufacturer's calibration must be performed.

| Target Gas (%) | Ambient Air Purge Gas Readings (%) | Acceptable Ambient Air Range (%) | Calibration Gas Instrument Readings (%) | Acceptable Calibration Gas Range (%) | Pass/Fail |
|---|---|---|---|---|---|
| $CH_4$ | 0.0 | 0.0 - 0.3 | 49.9 | 47.0 - 53.0 | Pass |
| $CO_2$ | 0.0 | 0.0 - 0.3 | 35.0 | 32.0 - 38.0 | Pass |
| $O_2$ | 20.8 | 19.9 - 21.9 | 0.0 | 0.0 - 1.0 | Pass |

# CERTIFICATION OF CALIBRATION

ISSUED BY: Landtec North America Instrument Services Facility
Date Of Calibration: February 10, 2016
Certificate Number: G500213_4/17505

PJLA Calibration Accreditation No. 66916



Approved By Signatory

Dorian Venditto
Laboratory Inspection

LANDTEC

Landtec North America Instrument Services Facility, 850 South Via Lata, Suite 112, Colton CA, 92324
www.landtecna.com

***Customer:*** ***SGS Field Services***

3900 Kilroy Airport Way
Suite 100
Long Beach, CA 90806
USA

***Description:*** GEM5000 ***Model:*** GEM5000
***Serial Number:*** G500213

**Accredited Results:**

| Methane (CH4) | | |
|---|---|---|
| Certified Gas (%) | Instrument Reading (%) | Uncertainty (%) |
| 5.0 | 4.9 | 0.42 |
| 15.0 | 14.9 | 0.66 |
| 50.0 | 49.7 | 1.03 |

| Carbon Dioxide (CO2) | | |
|---|---|---|
| Certified Gas (%) | Instrument Reading (%) | Uncertainty (%) |
| 5.0 | 4.8 | 0.43 |
| 15.0 | 14.6 | 0.71 |
| 50.0 | 49.8 | 1.19 |

| Oxygen (O2) | | |
|---|---|---|
| Certified Gas (%) | Instrument Reading (%) | Uncertainty (%) |
| 21.0 | 21.0 | 0.25 |

Gas cylinders are traceable and details can be provided if requested.

CH4, CO2 readings recorded at: 35.3 °C/95.5 °F Barometric Pressure: 29.13 "Hg
O2 readings recorded at: 25.2 °C/77.4 °F

Method of Test: The analyzer is calibrated in a temperature controlled chamber using reference gases. All analyzers are calibrated in accordance with our procedure ISP-17 using high purity grade gas.

All calibrations are performed in accordance with ISO 17025 at LANDTEC, an ISO 17025:2005 – accredited service facility through PJLA.

*The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with NIST requirements.*

# CERTIFICATION OF CALIBRATION

PJLA ACCREDITED CALIBRATION LABORATORY NO. 66916

Certificate Number
G500213_4/17505



**Non Accredited results:**

| Pressure Transducers (inches of water column) | | | | | |
|---|---|---|---|---|---|
| Transducer | Certified (Low) | Reading (Low) | Certified (High) | Reading (High) | Accuracy |
| Static | 0" | 0.00" | 40" | 40.02" | 2.0" |
| Differential | 0" | 0.00" | 4" | 4.02" | 0.7" |

| Barometer (mbar) | |
|---|---|
| Reference | Instrument Reading |
| 0986 mbar / 29.13 "Hg | 0985 mbar / 29.10 "Hg |

| Additional Gas Cells | | |
|---|---|---|
| Gas | Certified Gas (ppm) | Instrument Reading (ppm) |
| H2 | 1000 | LOW |
| CO | 500 | 500 |
| H2S | 200 | 200 |

As received gas check readings:

| Methane (CH4) | |
|---|---|
| Certified Gas (%) | Instrument Reading (%) |
| 5.0 | 5.2 |
| 15.0 | 15.6 |
| 50.0 | 49.8 |

| Carbon Dioxide (CO2) | |
|---|---|
| Certified Gas (%) | Instrument Reading (%) |
| 5.0 | 5.0 |
| 15.0 | 14.9 |
| 50.0 | 50.2 |

| Oxygen (O2) | |
|---|---|
| Certified Gas (%) | Instrument Reading (%) |
| 21.0 | 20.4 |

As received Gas readings recorded at: 35.3 °C/95.5 °F
As received Barometric Pressure recorded at: 25.2 °C/77.4 °F

End of Certificate