

# Landfill Gas Monitoring Plan

**Avery County C&D Landfill Facility**  
**Ingalls, North Carolina**  
Permit No. 06-03

**DIN 26148**  
Approved by SWS  
May 31, 2016

Prepared For:  
**Avery County Solid Waste Department**  
**Newland, North Carolina**

**S+G Project No. AVERY 15-7**

DocuSigned by:  
*Madeline German*

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Project Geologist



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*Joan A. Smyth*

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**Revised: May 2016**  
**Original Submittal: March 2016**

NC LIC. NO. C-0828 (ENGINEERING)

# SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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# Avery County Solid Waste Facility Landfill Gas Monitoring Plan

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## 1.0 INTRODUCTION

This Landfill Gas (LFG) Monitoring Plan (plan) was prepared by Smith Gardner, Inc. (S+G) to describe the LFG monitoring program at the Avery County C&D Landfill (NC Solid Waste Permit 06-03), which is located at 2175 Brushy Creek Road, Ingalls, North Carolina. This plan describes the necessary procedures to satisfy applicable regulatory requirements (**Section 1.1**) for landfill gas monitoring.

The best available site data, practices, experience, and judgment were utilized to develop this plan. However, the plan may require modifications over time to accommodate changing landfill conditions, changing receptors in areas adjacent to and around the landfill, or other conditions that cannot be fully anticipated.

Uncontrolled migration of LFG (particularly methane (CH<sub>4</sub>)) can result in, loss of life, injury, property loss, vegetative damage, and intolerable odors. Landfill monitoring includes exposure to explosive gases. Monitoring personnel should be specifically trained in the management and response for situations such as fire or explosion and confined space entry and possess an awareness of changing conditions around the landfill.

Note that this plan does not address landfill gas collection and control, air quality, or other related landfill gas regulations or requirements which may be applicable to this site at present or in the future.

### 1.1 Regulatory Requirements – C&D Landfills

Rule 15A NCAC 13B.0544(d) of the North Carolina Solid Waste Management Rules requires the following for facilities having a C&D landfill:

- *Owners or operators of C&D landfill units must ensure that:*
  - *the concentration of methane gas or other explosive gases generated by the facility does not exceed 25 percent of the lower explosive limit in on-site facility structures (excluding gas control or recovery system components);*
  - *the concentration of methane gas or other explosive gases does not exceed the lower explosive limit for methane or other explosive gases at the facility property boundary; and*
  - *the facility does not release methane gas or other explosive gases in any concentration that can be detected in off-site structures.*
- *Owners or operators of C&D landfill units must implement a routine methane monitoring program and perform monitoring on at least a quarterly basis.*
- *If regulatory limits for methane gas concentrations are exceeded, a contingency plan must be implemented for the protection of human health and safety.*

## 1.2 Guidance Document

This plan was developed generally following the Landfill Gas Monitoring Guidance document prepared by the North Carolina Department of Environment Quality (NC DEQ), Division of Waste Management (DWM)<sup>1</sup>.

## 1.3 Contact Information

Correspondence and questions concerning this plan should be directed to the appropriate contact below:

### 1.3.1 Owner

#### **Avery County**

Avery County C&D Landfill  
2175 Brushy Creek Road  
Ingalls, North Carolina 28657  
Scalehouse Phone: (828) 765-7852

Avery County C&D Landfill (Mailing Address)  
2175 Brushy Creek Road  
Spruce Pine, North Carolina 28777

Avery County Solid Waste Department (Office)  
175 Linville Street  
Newland, North Carolina 28657  
Phone: (828) 737-5420

Contact: Eric Foster, Solid Waste Director  
[avery.sw@averycountync.gov](mailto:avery.sw@averycountync.gov)

### 1.3.2 Engineer

#### **Smith Gardner, Inc.**

14 N. Boylan Avenue  
Raleigh, North Carolina 27603  
Phone: (919) 828-0577

Contacts: Joan A. Smyth, P.G., Senior Hydrogeologist  
[joan@smithgardnerinc.com](mailto:joan@smithgardnerinc.com)  
Stacey A. Smith, P.E., Senior Engineer  
[stacey@smithgardnerinc.com](mailto:stacey@smithgardnerinc.com)

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<sup>1</sup> NC DENR DWM (2010), "Landfill Gas Monitoring Guidance", NC DENR DWM Solid Waste Section, November 2010.

### 1.3.3 North Carolina Department of Environmental Quality

**North Carolina DEQ** - Raleigh Central Office (RCO)  
217 W Jones Street  
Raleigh, North Carolina 27603  
Phone: (919) 707-8200

Contact: Mr. Perry Sugg  
[perry.sugg@ncdenr.gov](mailto:perry.sugg@ncdenr.gov)

## 1.4 Existing Site Conditions

The Avery County C&D Landfill facility (Permit 06-03), located at 2175 Brushy Creek Rd, Ingalls, NC was in operation from 1996 to 2008. The Facility is located approximately 1.8 miles northeast of the intersection of Highway 19 East and Brushy Creek Road or 1.5 miles northeast from the Avery County Airport. There is residential development in the site vicinity (within 2000 feet) and commercial development within two (2) miles. The C&D landfill is approximately 5.4 acres; the site is bounded by forested, undeveloped land to the north and by low density residential development to the south, east and west. The site and monitoring network are shown on **Figure 1**.

### 1.4.1 Site Geology

The Avery County C&D landfill is located in the Blue Ridge Province of North Carolina, approximately 12 miles from the Brevard Fault zone. Local bedrock is comprised of the Alligator Back formation which is a finely laminated gneiss. Micaceous conglomerate, schist and phyllite are also found within this formation. Amphibolite was noted in central to northern portions of the site. The site has been investigated with a total of 16 monitoring wells and piezometers that range in depth from approximately 20 feet below grade to 88 feet below grade. Bedrock at the site was encountered at depths that ranged from 31 feet below grade to 88 feet below grade.

Unconsolidated sediments at the site consist of variably micaceous clayey silt to silty sand weathered from the underlying bedrock. The unconsolidated sediments are grouped into two lithological units. Unit 1A consists of sediments exhibiting a standard penetration test of less than 100 blows per foot, while Unit 1B consists of sediments exhibiting a standard penetration test of greater than 100 blows per foot.

### 1.4.2 Local Groundwater Regime

Groundwater flows from north to south toward the discharge points on-site streams and Brushy Creek (located across Brushy Creek Road). Depth to

groundwater ranges from approximately 2865 feet amsl<sup>2</sup> to approximately 3020 feet amsl; with an average gradient of 0.12 ft/ft and an average groundwater velocity of 1.57 ft/day. Lithological Unit 1A has an average hydraulic conductivity of 1.40 ft/day, while Unit 1B has an average hydraulic conductivity of 2.05 ft/day. The bedrock aquifer (Unit 2) has an average hydraulic conductivity of 4.65 ft/day.

---

<sup>2</sup> amsl = above mean sea level

## 2.0 MONITORING PROGRAM

The landfill gas monitoring plan contained herein includes landfill gas monitoring wells and structures to be monitored for subsurface landfill gas<sup>3</sup> migration.

### 2.1 Perimeter Monitoring Wells

The monitoring wells are shown on **Figure 1**.

#### 2.1.1 Existing Network

The perimeter LFG monitoring system is designed to intercept potential migrating LFG. The existing LFG monitoring network for the Avery County C&D Landfill includes four wells (GP-1, GP-2, GP-3 and GP-4).

GP-1 is located south of the C&D Phase 2 unit, near CDMW-1A. GP-2 is positioned inside the property line at the southeastern corner of the C&D landfill. GP-3 is located approximately north of Sediment Basin 3 on the eastern side of the C&D Phase 2 unit. GP-4 is located on the eastern side of the C&D landfill near the junction of Phase 2 and 3. Streams and wetland, natural barriers to LFG migration, are present along the western side of the C&D as well as at the property line north of the C&D unit. Landfill gas monitoring locations are shown on **Figure 1**.

Landfill gas monitoring points are focused along the eastern property line where natural barriers are less prevalent to possible migration pathways. Available well logs are provided in **Appendix A**. The landfill gas monitoring network includes the wells summarized below:

LFG Monitoring Location	Screened Interval (ft bgs)	Total Depth (ft bgs)
GP-1	4-12	12
GP-2	5-9	9
GP-3	5-20	20
GP-4	5-20	20

#### 2.1.2 LFG Monitoring Well Construction

The LFG monitoring wells were installed to depths above the water table in accordance with 15A NCAC 2C by Mad Dawg Drilling, Inc. in October 2009. Wells were advanced using hollow stem auger (has) drilling technology and constructed of two-inch diameter, manufactured PVC well screens with 10-slot

<sup>3</sup> The composition of landfill gas is typically approximately 50 percent **methane** and 50 percent **carbon dioxide** with trace amounts (<1 percent) of nitrogen, oxygen, **hydrogen sulfide**, hydrogen, and non-methane organic compounds (NMOCs). Of these, methane and hydrogen sulfide are of concern.

per inch intake spacing and solid PVC riser pipe. A sand filter pack was placed around the screened interval, to a height of one to three feet above the screen and a hydrated bentonite plug of two to five feet in thickness was positioned above the sand pack to seal each well. A protective anodized aluminum casing and a cement pad for surface protection were also installed. Quick-connect fittings or stop-cock valves were installed in the cap as a monitoring port in accordance with SWS guidance.

## **2.2 Monitoring of Facility Structures**

Occupied structures on the property will be monitored quarterly. The following facility structures will be monitored:

- Scalehouse

If desired, a dedicated methane monitor may be installed within one or more of these structures. Otherwise, monitoring will be conducted quarterly with the landfill gas monitoring wells.

Monitored facility structures are shown on **Figure 1**.

## **2.3 Monitoring and Reporting**

Monitoring and reporting of LFG concentrations will be performed as outlined below. During these events the following LFG constituents will be monitored: methane, hydrogen sulfide, oxygen and carbon dioxide.

### **2.3.1 Frequency**

Routine LFG monitoring will be conducted on a quarterly basis.

### **2.3.2 Personnel**

LFG monitoring will be performed by personnel who are familiar with the requirements of this plan and who are trained in LFG hazards and explosive gas meter use. As practical, a designated technician will be assigned to regular LFG monitoring duty.

### **2.3.3 Equipment**

A portable gas analyzer will be used to monitor LFG probes. This analyzer, which is calibrated to methane (CH<sub>4</sub>), operates using the infrared spectral property of methane to measure concentrations in air. Measurements of oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) will also be made with this meter. This meter may be used in oxygen deficient areas (less than 10% O<sub>2</sub>) since oxygen is not required for a chemical combustion of flammable gases within the meter.

Hydrogen sulfide (H<sub>2</sub>S) will also be monitored either with the same meter or with a specific hydrogen sulfide meter.

On the day of monitoring, prior to monitoring activities, meters will be field calibrated. All monitoring equipment should be regularly calibrated in accordance with manufacturer's specifications and operated only as instructed.

### 2.3.4 Procedures

Prior to each monitoring event, the portable gas analyzer will be calibrated with a known calibration standard in accordance with manufacturer's recommendations. General information related to the monitoring event, equipment used, calibration procedures, weather conditions, and results for each monitoring event will be recorded on the landfill gas monitoring data form (**Appendix B**).

The following steps outline the procedure for the monitoring of LFG wells and facility structures:

- Check calibration date on the meters and calibrate according to manufacturer's instructions; allowing equipment to warm up properly prior to use, per manufacturers direction.
- Purge sample tube for one minute before monitoring.

#### LFG Monitoring Wells:

- Connect instrument tubing to sample port on the monitoring well without removing the cap.
- Open the valve and record both the initial and stabilized methane concentrations. A stabilized concentration will not vary more than 0.5 percent by volume on the instrument's scale. Also record the oxygen concentration (at two percent per volume or less to indicate air is not being drawn into the system and providing false readings) and the carbon dioxide concentration.
- Close the valve and disconnect the tubing.
- Record monitoring data on the LFG monitoring data form provided in **Appendix B**.
- If any methane concentration is **greater than 50% of the LEL (2.5% CH<sub>4</sub>)**, monitoring personnel should implement the Precautionary Action Plan (Section 2.3.5).
- If both initial and stabilized methane concentrations are less than 50% of the LEL (2.5% CH<sub>4</sub>), move to next LFG monitoring well.
- If any hydrogen sulfide concentration is greater than 4%, monitoring personnel should, immediately recalibrate and re-

measure the location. If the concentration is still above 4%, notify the Landfill Manager and the Engineer.

Structures:

- Walk through the facility structure with a portable methane analyzer and monitor the perimeter wall interface of the structure, the floor to wall interface in hallways and rooms, and any floor penetrations in the structure. Record the initial and stabilized methane concentrations, oxygen concentration, and carbon dioxide concentration.
- Record monitoring data on the LFG monitoring data form provided in **Appendix B**.
- Notify the Landfill Manager, Operations Manager and the Engineer for any methane concentration greater than 0% of the LEL.

***IF A STABILIZED METHANE CONCENTRATION IS GREATER THAN 100% OF THE LEL IN A LFG MONITORING WELL OR GREATER THAN 25% OF THE LEL IN A FACILITY STRUCTURE, THE FOLLOWING ACTIONS WILL BE IMPLEMENTED:***

- 1) Recalibrate monitoring equipment and confirm results.
- 2) If results are confirmed, **IMMEDIATELY** contact the Landfill Manager and the Engineer.
- 3) Implement the Action Plan located in **Section 3.1**.

A flowchart of potential actions if exceedances are noted, is included as **Figure 2**.

### 2.3.5 Precautionary Action Plan

If an initial or stabilized methane concentration is equal to or greater than 50% of the LEL in a LFG monitoring well, monitoring personnel should perform the following additional steps at this location:

- Measure gas pressure in the well head (in inches of water) using magnehelic gauge or other appropriate metering device.
- Record at least one additional methane concentration measurement, inside the well just below the top of casing.
- Evaluate the surrounding area for potential receptors to or signs of LFG migration. LFG can stress vegetation and can kill trees and grass by root asphyxiation. Note stressed/dead vegetation areas on the monitoring form.
- Notify the Landfill Manager and the Engineer for further evaluation.

### 2.3.6 Record Keeping

Routine LFG monitoring events will be documented on the LFG monitoring data form provided in **Appendix B**. Completed forms will be placed in the landfill operating record. These forms will be available for review by DWM personnel on request.

Documentation of any contingency plan actions (**Section 3.0**) will also be kept in the operating record.

## 2.4 Maintenance

Periodic maintenance and site observations will be conducted routinely to address monitoring program components (at a minimum):

- Maintain access to LFG monitoring locations.
- Perform LFG monitoring well maintenance (maintain well locks, steel casing, concrete pad, etc.).
- Observe landfill cover conditions, areas of dead vegetation, leachate seeps, odors, etc. as indications of potential LFG-related problems.

Note deficiencies on the monitoring forms and report to the Solid Waste Operations Manager for repair or replacement as necessary.

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### 3.0 CONTINGENCY PLAN

If stabilized **explosive gasses are detected at concentrations greater than 100% of the LEL in a LFG monitoring well or greater than 25% of the LEL in a facility structure**, the technician will perform the actions in the immediate action plan and prepare a remediation plan as described below.

#### 3.1 Immediate Action Plan

The Solid Waste Operations Manager will perform the following actions for the protection of human health and safety:

- 1) Evacuate affected facility structures and the immediate surrounding area.
- 2) Determine nearby potential receptors (facility and off-site structures).
- 3) Perform monitoring in any other facility structure near the monitoring location having the high concentration.
- 4) Contact the County Fire Department (911). Coordinate evaluation of potentially affected off-site structures with the Fire Department.
- 5) Verbally notify the Landfill Manager.
- 6) Verbally notify the NCDEQ DWM (**Section 1.1**) as soon as practical.
- 7) Investigate and identify the potential source(s) and conduit(s) for LFG migration that may have caused the high concentration (i.e. the migration path that the LFG may be following to the monitoring location).
- 8) Identify the LFG extent using bar hole punch sampling methodology or other applicable alternative method as practical.
- 9) As appropriate, begin corrective action to control methane concentrations in structures surrounding the landfill site.

##### 3.1.1 Reporting and Documentation

Within seven days of the detection of a high methane and/or explosive gas concentration, the Facility will prepare and submit an Environmental Monitoring Reporting Form (**Appendix B**) with the results of the monitoring event to the DWM. The facility will place a description of the actions performed to protect human health in the operating record.

#### 3.2 Remediation Plan

Within sixty days of the detection of a high methane and/or explosive gas concentration, a remediation plan describing the problem nature, extent, and proposed remedy will be submitted to NCDEQ for approval. Following approval the plan will be implemented and a copy will be placed in the operating record. The DWM will also be notified the plan has been implemented.

An extension may be granted by the DWM on written request and depending on severity of the situation.

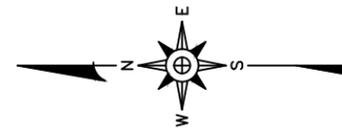
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## **Figures**

**Landfill Gas Monitoring Plan  
Avery County Solid Waste Facility  
Ingalls, North Carolina**

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**LEGEND**

- 3000 EXISTING CONTOUR
- PROPERTY LINE (SEE REFERENCE 2)
- PERMITTED WASTE LIMITS
- APPROXIMATE STREAM AND DRAINAGE LOCATION
- CDMW-4S C&D MONITORING WELL
- PZ-14 PIEZOMETER
- GP-3 LANDFILL GAS WELL
- SW-1 APPROXIMATE SURFACE WATER SAMPLING LOCATION

**REFERENCES**

1. AERIAL PHOTOGRAPHY FROM BING MAPS, A MICROSOFT CORPORATION.
2. SITE PROPERTY LINE AND MONITORING WELL LOCATIONS FROM FIELD SURVEYS DATED JANUARY 29, 2010, BY SURVEYING SOLUTIONS, P.C.



PREPARED BY: \_\_\_\_\_ NC LIC. NO. C-0828 (ENGINEERING)

**SMITH+GARDNER**  
14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

FIGURE NO.	1
SCALE:	AS SHOWN
APPROVED:	C.T.S.
DRAWN:	J.A.L.
PROJECT NO.:	FILENAME: AVERY-B0257
DATE:	PROJECT NO.:
	AVERY 15-7
	F00 2016

PREPARED FOR:

**AVERY COUNTY C&D LANDFILL  
LANDFILL GAS MONITORING LOCATION MAP**

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MONITORING FREQUENCY IS QUARTERLY

METHANE CONCENTRATION MUST NOT EXCEED:  
 1. 25% OF THE LEL IN FACILITY STRUCTURES; AND  
 2. 100% OF THE LEL AT THE FACILITY PROPERTY BOUNDARY.

IF METHANE CONCENTRATION EXCEEDS EITHER OF THE ABOVE, THE OWNER MUST:

RECALIBRATE METER AND CONFIRM READINGS  
 (SEE SECTION 2.3.4 OF LFG MANAGEMENT PLAN)

IF CONFIRMED READINGS EXCEED LIMITS,  
 (SEE SECTION 3.0 OF THE LFG MANAGEMENT PLAN) AND:

1. IMMEDIATELY:  
 TAKE STEPS TO ENSURE PROTECTION OF HUMAN HEALTH AND SAFETY

2. WITHIN 7 DAYS:  
 PLACE THE METHANE READINGS AND STEPS TAKEN TO PROTECT HUMAN HEALTH IN THE OPERATING RECORD

3. WITHIN 60 DAYS:  
 PREPARE A REMEDIATION PLAN. SUBMIT PLAN TO NCDENR FOR APPROVAL. UPON APPROVAL, IMPLEMENT PLAN.

**SMITH+GARDNER ENGINEERS** NOTIFY THE ENGINEER AND DIVISION WITHIN 24 HOURS 

PLACE A COPY OF THE REMEDIATION PLAN IN THE OPERATING RECORD, AND

EVALUATE THE NEED FOR ADDITIONAL MONITORING

NOTIFY THE DIVISION THAT THE PLAN HAS BEEN IMPLEMENTED

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PREPARED FOR:  
**FLOWCHART OF METHANE MONITORING REQUIREMENTS AVERY COUNTY C&D LANDFILL**

PREPARED BY: \_\_\_\_\_ NC LIC. NO. C-0828 [ENGINEERING]  
**SMITH+GARDNER**  
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

DRAWN: J.A.L.	APPROVED: J.A.S.	SCALE: N.T.S.	DATE: Jan 2016	PROJECT NO.: AVERY 15-7	FIGURE NO.: 2	FILE NAME: AVERY-A0249
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## **Appendix A**

### **Well Logs**

**Landfill Gas Monitoring Plan  
Avery County Solid Waste Facility  
Ingalls, North Carolina**

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**Richardson Smith Gardner & Assoc**  
 14 North Boylan Avenue, Raleigh NC 27603  
 (919) 828-0577

**FIELD BOREHOLE LOG**

BOREHOLE NUMBER **GP-1**

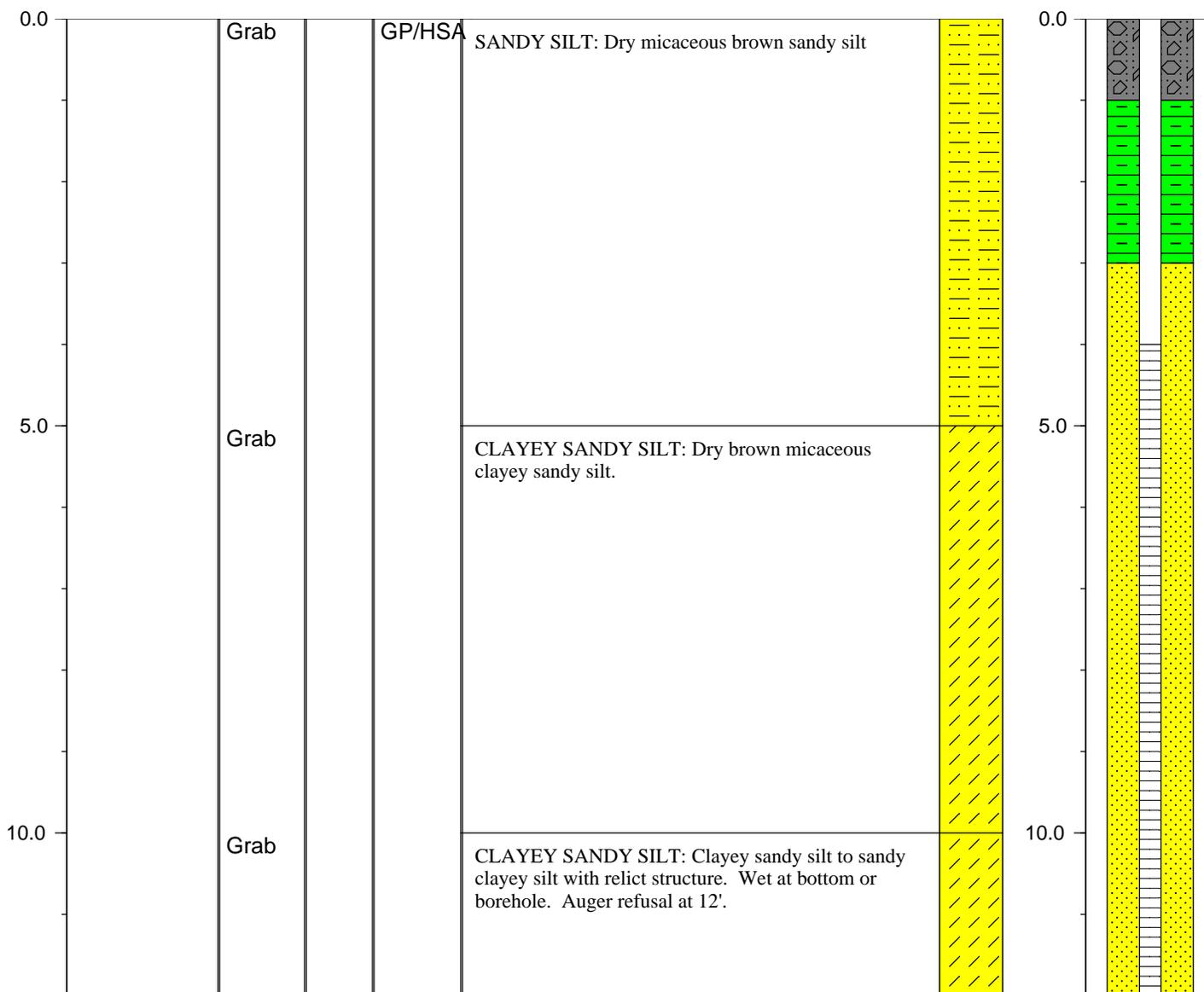
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**  
 LOCATION: **Ingalls, NC**  
 DRILLING CO: **Mad Dawg Drilling Inc**  
 DRILLING METHOD: **Geoprobe/HSA**  
 FIELD PARTY: **Tom Whitehead**  
 GEOLOGIST: **Don Misenheimer**  
 DATE BEGUN: **10/26/09** COMPLETED: **10/26/09**

TOTAL DEPTH: **12**  
 TOP OF CASING ELEV.: **GROUND ELEV.:**  
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)	--	--
Time	--	--
Date	--	--

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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**Richardson Smith Gardner & Assoc**  
 14 North Boylan Avenue, Raleigh NC 27603  
 (919) 828-0577

**FIELD BOREHOLE LOG**

BOREHOLE NUMBER **GP-2**

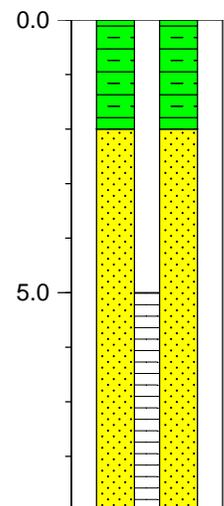
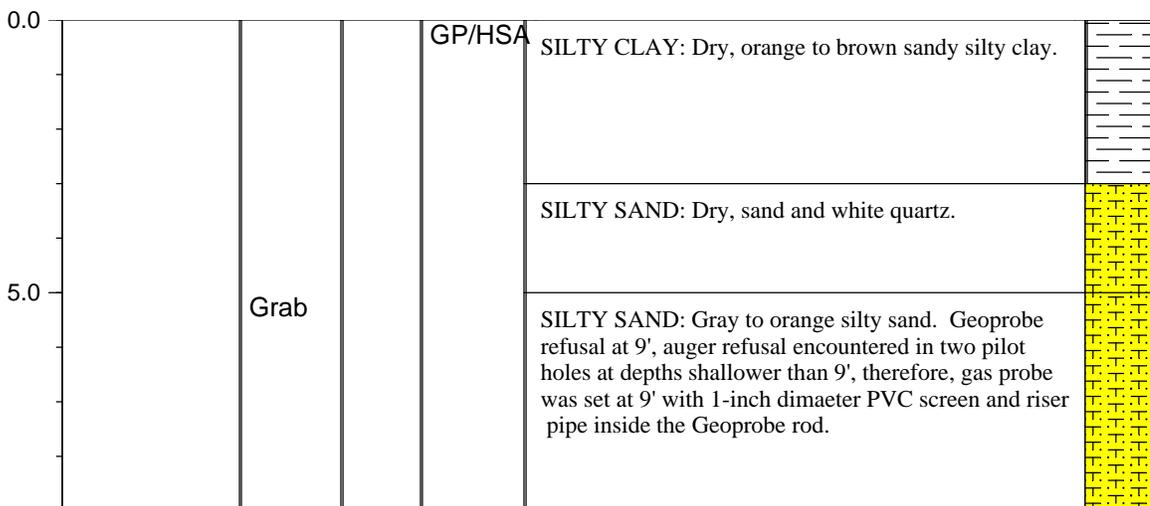
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**  
 LOCATION: **Ingalls, NC**  
 DRILLING CO: **Mad Dawg Drilling Inc**  
 DRILLING METHOD: **Geoprobe/HSA**  
 FIELD PARTY: **Tom Whitehead**  
 GEOLOGIST: **Don Misenheimer**  
 DATE BEGUN: **10/29/09** COMPLETED: **10/29/09**

TOTAL DEPTH: **9**  
 TOP OF CASING ELEV.: **GROUND ELEV.:**  
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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## FIELD BOREHOLE LOG

BOREHOLE NUMBER **GP-3**

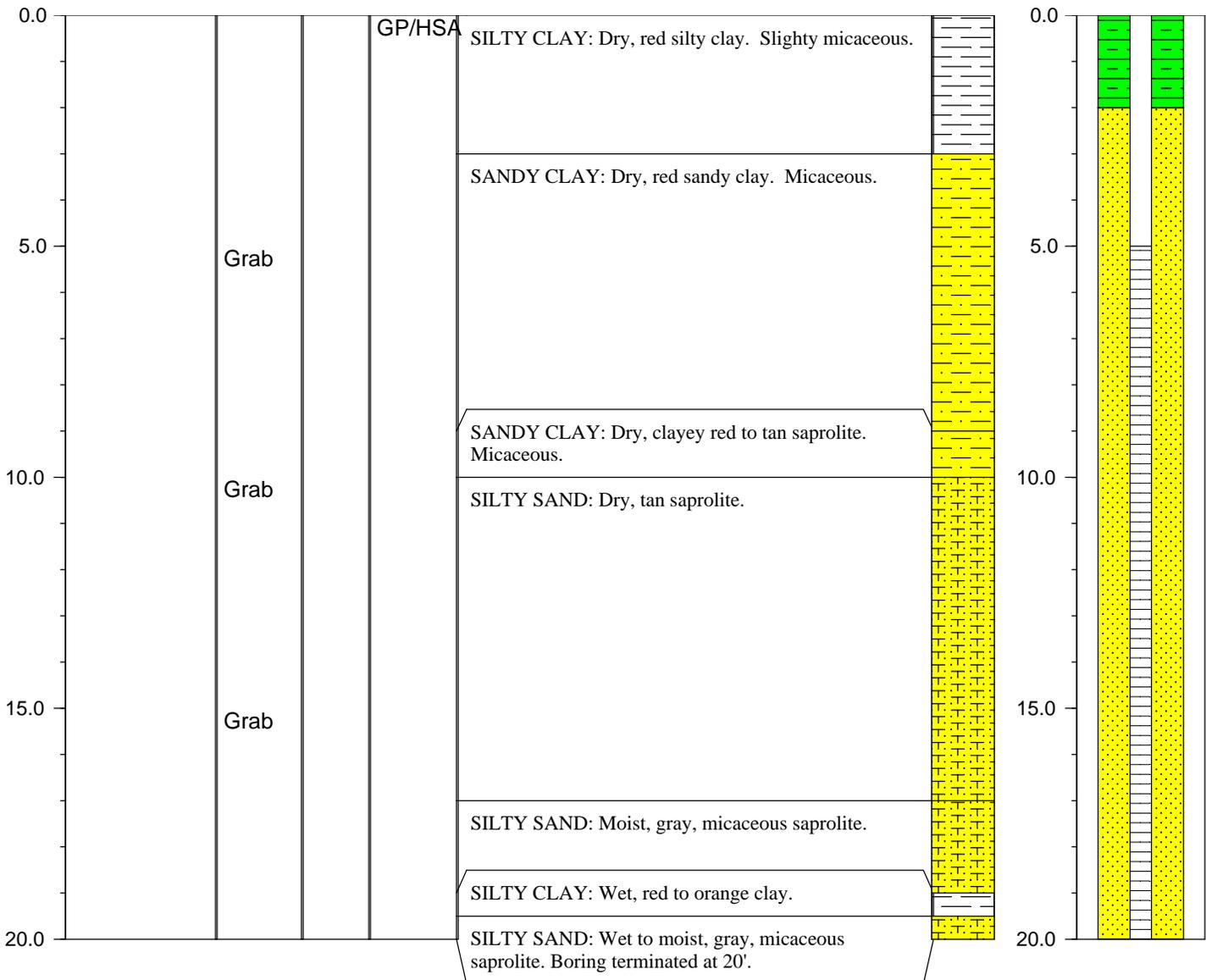
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**  
 LOCATION: **Ingalls, NC**  
 DRILLING CO: **Mad Dawg Drilling Inc**  
 DRILLING METHOD: **Geoprobe/HSA**  
 FIELD PARTY: **Tom Whitehead**  
 GEOLOGIST: **Don Misenheimer**  
 DATE BEGUN: **10/26/09** COMPLETED: **10/26/09**

TOTAL DEPTH: **20**  
 TOP OF CASING ELEV.: **GROUND ELEV.:**  
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)	--	--
Time	--	--
Date	--	--

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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**Richardson Smith Gardner & Assoc**  
 14 North Boylan Avenue, Raleigh NC 27603  
 (919) 828-0577

**FIELD BOREHOLE LOG**

BOREHOLE NUMBER **GP-4**

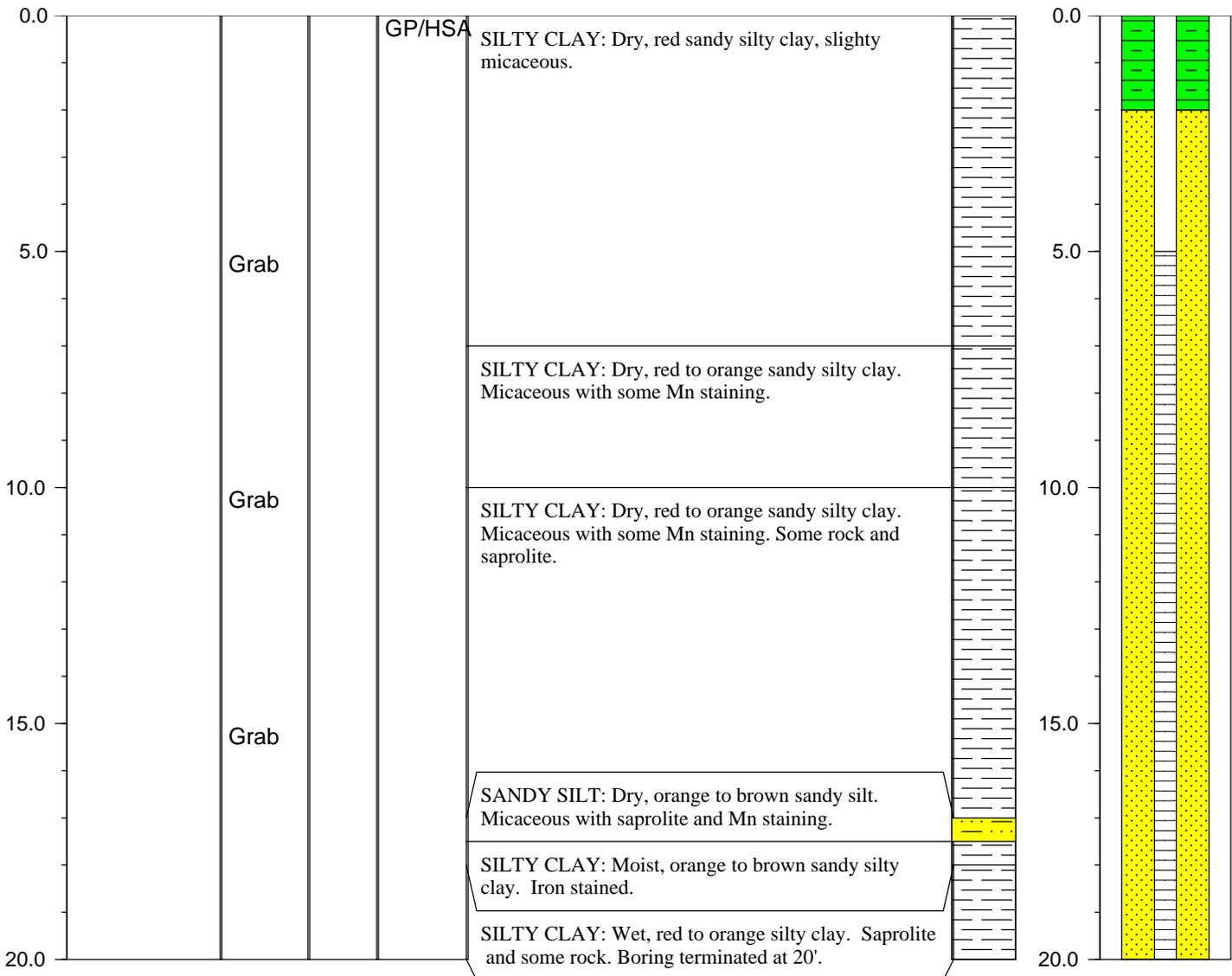
Page 1 of 1

PROJECT NAME: **Avery County C&D Landfill**  
 LOCATION: **Ingalls, NC**  
 DRILLING CO: **Mad Dawg Drilling Inc**  
 DRILLING METHOD: **Geoprobe/HSA**  
 FIELD PARTY: **Tom Whitehead**  
 GEOLOGIST: **Don Misenheimer**  
 DATE BEGUN: **10/29/09** COMPLETED: **10/29/09**

TOTAL DEPTH: **20**  
 TOP OF CASING ELEV.: **GROUND ELEV.:**  
 NORTHING: **0** EASTING: **0**

STATIC WATER LEVEL (BLS)		
Depth (ft)		
Time		
Date		

DEPTH Feet	BLOW COUNT Per 6"	SAMPLING METHOD	RECOVERY Inches	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH Feet	WELL INSTALLATION
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## **Appendix B**

### **Reporting Forms**

**Landfill Gas Monitoring Plan  
Avery County Solid Waste Facility  
Ingalls, North Carolina**

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**DENR USE ONLY:**

Paper Report     Electronic Data - Email CD (data loaded: Yes / No)

Doc/Event #:

NC DENR

Division of Waste Management - Solid Waste

**Environmental Monitoring Reporting Form**

**Notice:** This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

**Instructions:**

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i)).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

**Solid Waste Monitoring Data Submittal Information**

Name of entity submitting data (laboratory, consultant, facility owner):

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

Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)

**Environmental Status: (Check all that apply)**

Initial/Background Monitoring     Detection Monitoring     Assessment Monitoring     Corrective Action

**Type of data submitted: (Check all that apply)**

Groundwater monitoring data from monitoring wells     Methane gas monitoring data  
 Groundwater monitoring data from private water supply wells     Corrective action data (specify) \_\_\_\_\_  
 Leachate monitoring data  
 Surface water monitoring data     Other(specify) \_\_\_\_\_

**Notification attached?**

- No. No groundwater or surface water standards were exceeded.
- Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
- Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

**Certification**

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Facility Representative Name (Print) \_\_\_\_\_ Title \_\_\_\_\_ (Area Code) Telephone Number \_\_\_\_\_  
 Affix NC Licensed/ Professional Geologist Seal

Signature \_\_\_\_\_ Date \_\_\_\_\_

Facility Representative Address \_\_\_\_\_

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

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