

**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):**

Richardson Smith Gardner and Associates, Inc.

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

Name: Joan A. Smyth, P.G. Phone: 919-828-0577 x 221

E-mail: joan@rsgengineers.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Avery County Closed MSW Landfill	Brushy Creek Road Spruce Pine, NC	06-01	.0500	April 11, 2010

**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  Other(specify) \_\_\_\_\_  
 Surface water monitoring data

**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.**

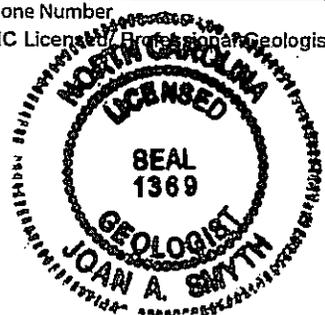
Joan A. Smyth, P.G. Senior Hydrogeologist 919-828-0577 x 221

Facility Representative Name (Print) Title (Area Code) Telephone Number  
Joan Smyth 6/8/10 Affix NC Licensed Professional Geologist Seal  
 Signature Date

14 N. Boylan Avenue Raleigh, NC 27603

Facility Representative Address

C0828



# **Closed Avery County MSW Landfill**

## **Ground Water Monitoring Report**

### **Spring 2010 Semi-annual Monitoring Event**

**Avery County Landfill  
Newland, North Carolina  
NC Solid Waste Permit # 06-01**

Prepared for:  
**Avery County Solid Waste**  
175 Linville St.  
Newland, North Carolina 28657

**June 2010**



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# Spring 2010 Ground Water Monitoring Report

## Avery County Closed MSW Landfill Newland, North Carolina NC Solid Waste Permit # 06-01

Prepared for:

**Avery County Solid Waste**  
175 Linville st.  
Newland, North Carolina 28657

RSG Project No. **Avery 09-2**



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Joan A. Smyth, P.G.  
Senior Hydrogeologist



**June 2010**



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**Avery County – MSW Landfill  
Semi-annual Ground Water Monitoring Report  
Spring 2010 Sampling Event**

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## 1.0 Introduction

Avery County is required to submit semi-annual ground water monitoring reports for the closed MSW landfill (permit # 06-01). This report, prepared by Richardson Smith Gardner and Associates, Inc (RSG), presents the results of the first semi-annual monitoring event for 2010. This event was performed to comply with the semi-annual monitoring schedule required by NC Solid Waste Regulations.

The ground water monitoring network for the MSW landfill includes three (3) ground water monitoring wells (MW-1, MW-2 & MW-3) and two surface water locations (SW-1 & SW-2). This report includes summaries of the field procedures and laboratory analyses for the MSW site. Also included are summary tables of the results and laboratory analytical reports.

## 2.0 Site Geology

The principal geologic units mapped in the immediate vicinity of the site include a mix of metamorphosed sedimentary and igneous rocks – termed *paragneiss* and *orthogneiss*, respectively – interlayered with contemporaneous schist, phyllite, and marble, later injected with various granitic intrusions, including plutons, pegmatites, and hydrothermal veins. Regional metamorphic grades in the region include kyanite-grade (high grade) and retrograde chlorite-biotite metamorphism (low grade). Major lithologic units near the site, from youngest to oldest, are:

**Dqd** - quartz diorite to granodiorite intrusive; contains biotite, muscovite and xenocrysts (included fragments of older rock units); Devonian age (390 MY); associated pegmatite veins are the target of the well-documented Spruce Pine mining district, which produced feldspars, mica, and quartz for various industries, along with emeralds and other gem stones;

**Zabg** - Gneiss of Alligator Back Formation; finely laminated to thin layered, contains massive gneiss and micaceous conglomerate; includes schist and phyllite; late Proterozoic age (750 MY);

**Zaba** - Amphibolite of Alligator Back Formation; equigranular, massive to well foliated, chiefly metamorphosed mafic rock; late Proterozoic age (750 MY); often occurring as large circular or elliptical areas marking plutonic stocks,<sup>1</sup> associated with pre-Appalachian rifting that formed an earlier ocean called Iapetus.<sup>2</sup>

**Ybgg** - biotite granitic gneiss; pinkish gray to light gray massive to well foliated; late to mid Proterozoic age (950-1250 my); associated with the Grenville *orogeny*. RSG has not performed any geologic investigation activities at this site, nor have we been able to locate any previous geologic studies for the site; therefore we can not provide more

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<sup>1</sup> <http://www.1911encyclopedia.org/Amphibolite>

<sup>2</sup> Stewart and Roberson, Exploring the Geology of the Carolinas, University of North Carolina Press, 2007

detail regarding site geology.

### 3.0 Sampling Procedures

The sampling event was performed by trained personnel from RSG on April 11, 2010, and consisted of collecting samples from three (3) ground water wells, shown in **Figure 1**. Surface water samples were collected from two locations (SW-1 and SW-2) adjacent to the landfill. Field data sheets for the monitoring wells are included in **Appendix A** and a table of well information is available in **Appendix B**. No boring logs for these monitoring wells could be located during a file search at NCDENR.

Sampling methods followed the protocol outlined in the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities (NCDENR, DWM). The depth to water in each well was gauged prior to purging and sampling. Field measurements of pH, specific conductivity, turbidity, and temperature were obtained from each well. Water table elevations and field parameter results are included in **Tables 1 and 2**, respectively.

All samples were collected by RSG personnel in laboratory prepared containers for the specified analytical procedures. Samples were collected using new factory sealed teflon bailers. Ground water samples were properly preserved, placed on ice, and transported to the laboratory facility (Environment 1, Inc.), within the specified holding times for each analysis.

### 4.0 Field and Laboratory Results

#### 4.1 Laboratory Analysis

All samples were transported to the laboratory facility under proper chain of custody analyzed at the specified DWM Solid Waste Quantitation Limits<sup>3</sup> for Appendix I constituents. The laboratory report is attached for your review as **Appendix C**.

#### 4.2 Field and Laboratory Results

Ground water and field measurements are included in **Tables 1 & 2**. Detected constituents are presented in **Table 3**.

Two (2) inorganic constituents (copper and zinc) were detected in three (3) wells (MW-1, MW-2, MW-3) above the SWSL, but below 2L or ground water protection (GWP) standards. One constituent, zinc was detected in SW-1 above the SWSL limit.

**Table 3** summarizes the list of constituents detected. Several inorganic and organic constituents were detected at concentrations below the SWSLs. These are listed as “J” values on **Table 3**.

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<sup>3</sup> New Guidelines for Electronic Submittal of Environmental Monitoring Data Memo, NCDENR – Solid Waste Section, October 27, 2006

## 5.0 Ground Water Characterization

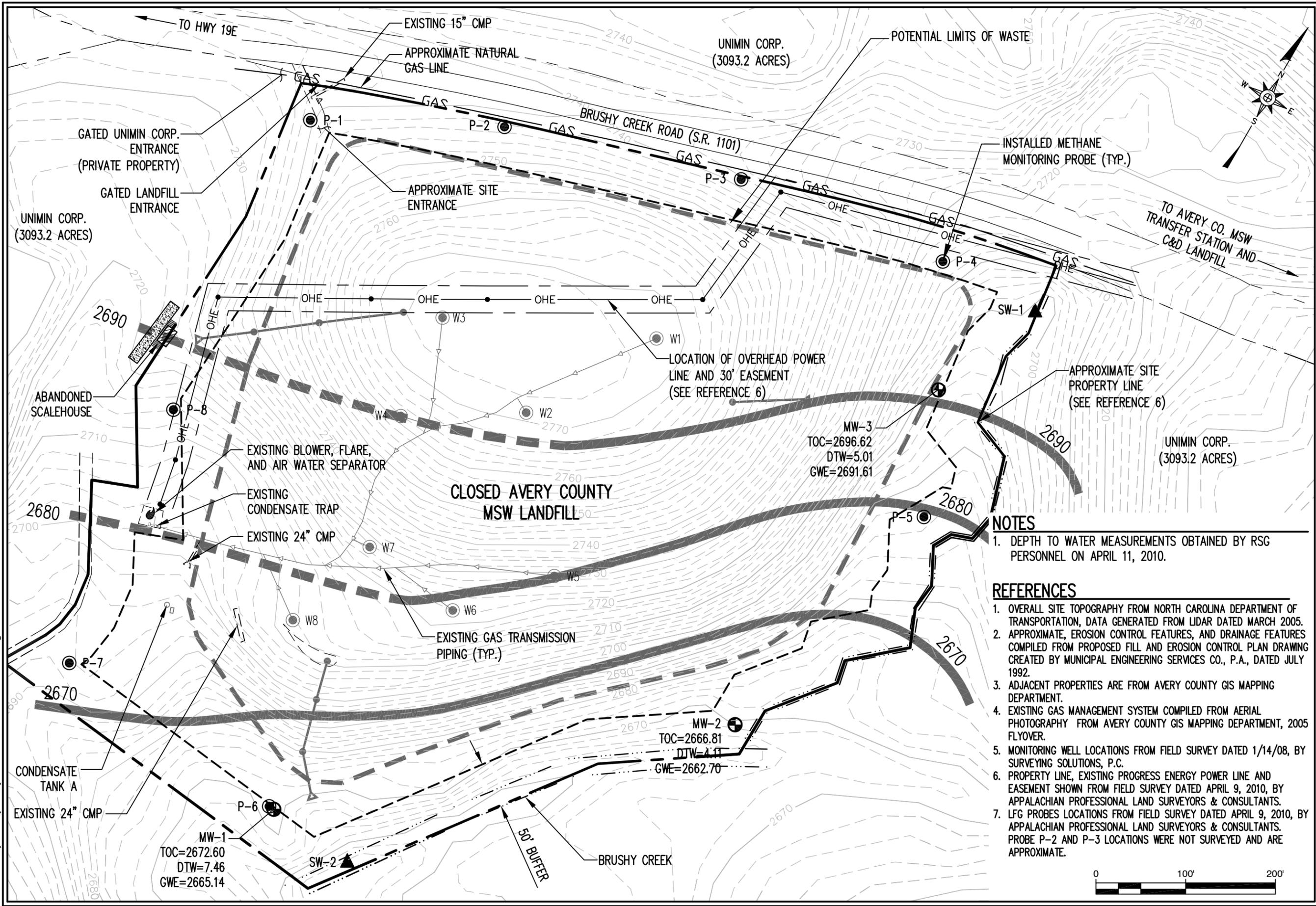
A potentiometric surface map was prepared from ground water elevation data collected during this sampling event. The data indicates that ground water is flowing generally to the south and southeast across most of the site. Hydraulic conductivity data was not available for these wells so ground water velocities could not be calculated. The potentiometric surface map (**Figure 1**) is also attached for your review.

## 6.0 Conclusions

The results of this monitoring event indicate detectable levels of two (2) inorganic constituents. None of these constituents were detected at concentrations above their respective 2L/GWP. The next ground water monitoring event is scheduled for September 2010. A report will be submitted to NCDENR upon receipt of laboratory analyses.

Figures

G:\CAD\Avery County\Avery 09-2\sheets\AVERY-B0140.dwg - 6/7/2010 4:49 PM

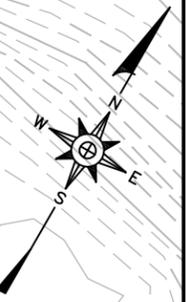


**NOTES**

1. DEPTH TO WATER MEASUREMENTS OBTAINED BY RSG PERSONNEL ON APRIL 11, 2010.

**REFERENCES**

1. OVERALL SITE TOPOGRAPHY FROM NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, DATA GENERATED FROM LIDAR DATED MARCH 2005.
2. APPROXIMATE, EROSION CONTROL FEATURES, AND DRAINAGE FEATURES COMPILED FROM PROPOSED FILL AND EROSION CONTROL PLAN DRAWING CREATED BY MUNICIPAL ENGINEERING SERVICES CO., P.A., DATED JULY 1992.
3. ADJACENT PROPERTIES ARE FROM AVERY COUNTY GIS MAPPING DEPARTMENT.
4. EXISTING GAS MANAGEMENT SYSTEM COMPILED FROM AERIAL PHOTOGRAPHY FROM AVERY COUNTY GIS MAPPING DEPARTMENT, 2005 FLYOVER.
5. MONITORING WELL LOCATIONS FROM FIELD SURVEY DATED 1/14/08, BY SURVEYING SOLUTIONS, P.C.
6. PROPERTY LINE, EXISTING PROGRESS ENERGY POWER LINE AND EASEMENT SHOWN FROM FIELD SURVEY DATED APRIL 9, 2010, BY APPALACHIAN PROFESSIONAL LAND SURVEYORS & CONSULTANTS.
7. LFG PROBES LOCATIONS FROM FIELD SURVEY DATED APRIL 9, 2010, BY APPALACHIAN PROFESSIONAL LAND SURVEYORS & CONSULTANTS. PROBE P-2 AND P-3 LOCATIONS WERE NOT SURVEYED AND ARE APPROXIMATE.



**RICHARDSON SMITH GARDNER & ASSOCIATES**  
 INC. LIC. NO. C-288 (Engineering)  
 www.rsgengineers.com  
 14 N. Boylan Ave. Raleigh, N.C. 27603  
 ph: 919-826-0577 fax: 919-826-3899

FIGURE NO.	1	FILE NAME	AVERY-B0140
SCALE:	AS NOTED	PROJECT NO.	AVER 09-2
CHECKED BY:	J.A.S.	DATE:	Jun. 2010
DRAWN BY:	W.R.B.		

**AVERY COUNTY  
 SOLID WASTE DEPARTMENT  
 AVERY COUNTY CLOSED MSWLF  
 POTENTIOMETRIC MAP SPRING '10**

Tables



By: DMM

Date: 6/2/2010

**Table 1**  
**Avery County MSW Landfill**  
**Ground Water Elevation Data**  
**4/11/2010**

<b>Well</b>	<b>Well location Northing</b>	<b>Well location Easting</b>	<b>TOC Elevation (feet)</b>	<b>Depth to Water (feet)</b>	<b>GW Elev (feet)</b>
MW-1	812705.6749	1114262.085	2672.6	7.46	2665.14
MW-2	813030.7307	1114625.494	2666.81	4.11	2662.7
MW-3	813531.8988	1114643.917	2696.62	5.01	2691.61

Water level measurements by RSG personnel.

**Table 2**  
**Avery County MSW Landfill**  
**Field Parameters**  
**4/11/2010**

Well Identification #	Temperature (°Celsius)	Turbidity (NTU)	Specific Conductivity (uS/cm)	pH
MW-1	12.5	110	230	6.9
MW-2	12.5	40	10	6.7
MW-3	13	84	150	7.2
SW-1	13.5	22	100	7.7
SW-2	12	4	30	8.2

- Note:**
1. pH measured with a 'Hanna" pH/EC/TDS Meter, type HI9811
  2. Water Levels measured with a Slope Indicator Water Level Meter
  3. Turbidity measured with a Hach 2100P turbidimeter
  4. Temperature measured with a laboratory grade thermometer.
  5. Data Collected by Don Misenheimer & Richard Sheehan of RSG Engineers Inc.

**Table 3**  
**Avery County MSW Landfill**  
**Detected Inorganic and Organic Constituents**  
**4/11/2010**

Constituents	SWSL	2L or GWP Standards	MW-1	MW-2	MW-3	SW-1	SW-2
Antimony	6	1.4	0.3 J	ND	0.6 J	ND	ND
Arsenic	10	50	0.3 J	0.4 J	1.5 J	ND	ND
Barium	100	2000	1.2 J	25.2 J	31 J	11.8 J	13.6 J
Beryllium	1	4	0.1 J	0.1 J	0.2 J	0.1 J	0.1 J
Cadmium	1	5	0.1 J	0.3 J	0.1 J	0.6 J	ND
Cobalt	10	70	0.6 J	1.3 J	2.8 J	0.6 J	0.6 J
Copper	10	1000	2.1 J	<b>36</b>	1.4 J	1 J	0.8 J
Lead	10	15	0.1 J	6.3 J	1.2 J	0.3 J	0.8 J
Nickel	50	100	2.3 J	0.9 J	1.1 J	0.5 J	0.4 J
Selenium	10	50	0.3 J	ND	ND	ND	ND
Total Chromium	10	50	ND	1.3 J	0.5 J	ND	ND
Thallium	5	0.28	0.1 J	ND	0.1 J	0.1 J	ND
Vanadium	25	3.5	1 J	2.8 J	2 J	1 J	0.7 J
Zinc	10	2100	<b>32</b>	<b>12</b>	<b>11</b>	<b>14</b>	6.6 J
Silver	10	17.5	0.1 J	0.1 J	0.1 J	0.1 J	ND
1,4-Dichlorobenzene	1	75	0.4 J	ND	ND	ND	ND
Cis-1,2-Dichloroethene	5	70	0.4 J	ND	ND	ND	ND

SWSL - Solid Waste Quantitation Limit  
 ND - Not detected at or above SWSL  
 Shading - Levels above 2L standard or no 2L standard  
 Bold Letters - Constituent detected above SWSL  
 J - Detected constituents below SWSL limit

All SWSLs, 2L Standards and Results are in ug/l.

Data from Environment 1 laboratory report dated 5/7/2010, ID# 6056.

Appendix A

Field Data Sheets

# Groundwater Monitoring Well Inspection Checklist

This checklist is provided to inform our clients about the health and maintenance of their groundwater monitoring wells. This checklist provides no information pertaining to groundwater quality, but focuses on the physical characteristics of the well and its vicinity.

Site: Avery MSW Date: 4/11/10  
 Well ID: MW-3 Initials: JJD

Please mark the appropriate box for the following areas of concern. If you answer NO, please explain in the comment box.

1. Well Vicinity		YES	NO
A. Well is assessable and surrounding area is safe for employees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B. Vicinity is free of potential contaminants.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C. Dead trees, etc. not in danger of falling and damaging wells.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D. Well is in the same location as on field maps.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E.	<input type="checkbox"/>	<input type="checkbox"/>	
Comments/ items addressed or to be addressed:			
<i>O.K.</i>			

2. Concrete Apron and Steel Case		YES	NO
A. Concrete apron is present and in good condition.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B. Steel case is present and upright.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C. Steel case is not movable and cemented in.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D. Steel case lid opens and closes correctly with no gaps. Lock can be easily applied.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E. Well tag is present with pertinent information.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
F. Well numbers are prominently displayed (Reflective address numbers, etc.).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
G. No evidence of tampering is present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
H. Lock operates properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
I.	<input type="checkbox"/>	<input type="checkbox"/>	
Comments/ items addressed or to be addressed:			
<i>No well tag.</i>			

3. PVC Riser		YES	NO
A. Monitoring cap is present and provides a tight seal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B. Riser is of appropriate height (has not been cut off too low within the steel case).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C. Riser is not loose/ easily moved.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D. Riser does not appear cracked, broken, or brittle.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E. No visual sign of external contamination entering well through riser.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
F.	<input type="checkbox"/>	<input type="checkbox"/>	
Comments/ items addressed or to be addressed:			
<i>O.K.</i>			

# Groundwater Monitoring Well Inspection Checklist

This checklist is provided to inform our clients about the health and maintenance of their groundwater monitoring wells. This checklist provides no information pertaining to groundwater quality, but focuses on the physical characteristics of the well and its vicinity.

Site: Avery MSW Date: 4/11/10  
 Well ID: MW-2 Initials: JD

Please mark the appropriate box for the following areas of concern. If you answer NO, please explain in the comment box.

1. Well Vicinity		YES	NO
A. Well is assessable and surrounding area is safe for employees.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B. Vicinity is free of potential contaminants.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C. Dead trees, etc. not in danger of falling and damaging wells.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D. Well is in the same location as on field maps.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Comments/ items addressed or to be addressed:  <p style="text-align: center;"><i>o.k.</i></p>			

2. Concrete Apron and Steel Case		YES	NO
A. Concrete apron is present and in good condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B. Steel case is present and upright.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C. Steel case is not movable and cemented in.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D. Steel case lid opens and closes correctly with no gaps. Lock can be easily applied.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E. Well tag is present with pertinent information.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
F. Well numbers are prominently displayed (Reflective address numbers, etc.).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
G. No evidence of tampering is present.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
H. Lock operates properly.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
I.	<input type="checkbox"/>	<input type="checkbox"/>	
Comments/ items addressed or to be addressed:  <p><i>IF concrete apron is present, it appears to be buried. No well tag present.</i></p>			

3. PVC Riser		YES	NO
A. Monitoring cap is present and provides a tight seal.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
B. Riser is of appropriate height (has not been cut off too low within the steel case).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
C. Riser is not loose/ easily moved.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
D. Riser does not appear cracked, broken, or brittle.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
E. No visual sign of external contamination entering well through riser.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
F.	<input type="checkbox"/>	<input type="checkbox"/>	
Comments/ items addressed or to be addressed:  <p style="text-align: center;"><i>o.k.</i></p>			

# Groundwater Monitoring Well Inspection Checklist

This checklist is provided to inform our clients about the health and maintenance of their groundwater monitoring wells. This checklist provides no information pertaining to groundwater quality, but focuses on the physical characteristics of the well and its vicinity.

Site: Avary MSW

Date: 4/11/00

Well ID: MW-1

Initials: JD

Please mark the appropriate box for the following areas of concern. If you answer NO, please explain in the comment box.

		YES	NO
<b>1. Well Vicinity</b>			
A. Well is assessable and surrounding area is safe for employees.	<input checked="" type="checkbox"/>		
B. Vicinity is free of potential contaminants.	<input checked="" type="checkbox"/>		
C. Dead trees, etc. not in danger of falling and damaging wells.	<input checked="" type="checkbox"/>		
D. Well is in the same location as on field maps.	<input checked="" type="checkbox"/>		
E.			
Comments/ items addressed or to be addressed:			
<i>O.K.</i>			

		YES	NO
<b>2. Concrete Apron and Steel Case</b>			
A. Concrete apron is present and in good condition.	<input checked="" type="checkbox"/>		
B. Steel case is present and upright.	<input checked="" type="checkbox"/>		
C. Steel case is not movable and cemented in.	<input checked="" type="checkbox"/>		
D. Steel case lid opens and closes correctly with no gaps. Lock can be easily applied.	<input checked="" type="checkbox"/>		
E. Well tag is present with pertinent information.	<input checked="" type="checkbox"/>		
F. Well numbers are prominently displayed (Reflective address numbers, etc.).	<input checked="" type="checkbox"/>		
G. No evidence of tampering is present.	<input checked="" type="checkbox"/>		
H. Lock operates properly.	<input checked="" type="checkbox"/>		
I.			
Comments/ items addressed or to be addressed:			
<i>Found well tag on ground and <del>is</del> attached to casing</i>			

		YES	NO
<b>3. PVC Riser</b>			
A. Monitoring cap is present and provides a tight seal.	<input checked="" type="checkbox"/>		
B. Riser is of appropriate height (has not been cut off too low within the steel case).	<input checked="" type="checkbox"/>		
C. Riser is not loose/ easily moved.	<input checked="" type="checkbox"/>		
D. Riser does not appear cracked, broken, or brittle.	<input checked="" type="checkbox"/>		
E. No visual sign of external contamination entering well through riser.	<input checked="" type="checkbox"/>		
F.			
Comments/ items addressed or to be addressed:			
<i>O.K.</i>			

## Appendix B

### Monitoring Well Information



By: KBS  
 Date: 11/5/2009

**Appendix B  
 Avery County MSW Landfill  
 Monitoring Well Information**

Well	Well location Northing	Well location Easting	TOC Elevation (feet)	Depth to Water (feet)	Depth to Bottom (feet)	Assumed Screen Interval
MW-1	812705.6749	1114262.085	2672.6	7.46	23.3	10' - 20'
MW-2	813030.7307	1114625.494	2666.81	4.11	14.41	4' - 14'
MW-3	813531.8988	1114643.917	2696.62	5.01	15.2	4' - 14'

Depth to Water and Depth to Bottom measured from the Top of Casing.

No boring logs or well records for these wells are available, therefore, the screened interval is assumed based upon field measurements.

Appendix C

Laboratory Analytical Report

# Environment 1, Incorporated

Drinking Water ID: 37715  
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE  
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208  
FAX (252) 756-0633

ID#: 6056

AVERY COUNTY LANDFILL (OLD)  
MS. JOAN SMYTH  
RICHARDSON SMITH GARDNER  
133 SPRING AVENUE  
FUQUAY VARINA ,NC 27526

DATE COLLECTED: 04/11/10  
DATE REPORTED : 05/07/10

REVIEWED BY: 

PARAMETERS	MDL	SWSL	MW-1	MW-2	MW-3	SW-1	SW-2	Analysis		Method			
								Date	Analyst	Code			
Antimony, ug/l	0.22	6.0	0.3 J	---	U	0.6 J	---	U	---	U	04/20/10	LFJ	EPA200.8
Arsenic, ug/l	0.04	10.0	0.3 J	0.4 J		1.5 J	---	U	---	U	04/23/10	LFJ	EPA200.8
Barium, ug/l	0.03	100.0	1.2 J	25.2 J		31 J	11.8 J		13.6 J		04/20/10	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	0.1 J	0.1 J		0.2 J	0.1 J		0.1 J		04/20/10	LFJ	EPA200.8
Cadmium, ug/l	0.02	1.0	0.1 J	0.3 J		0.1 J	0.6 J		---	U	04/20/10	LFJ	EPA200.8
Cobalt, ug/l	0.10	10.0	0.6 J	1.3 J		2.8 J	0.6 J		0.6 J		04/20/10	LFJ	EPA200.8
Copper, ug/l	0.03	10.0	2.1 J	36		1.4 J	1 J		0.8 J		04/20/10	LFJ	EPA200.8
Total Chromium, ug/l	0.03	10.0	---	U	1.3 J	0.5 J	---	U	---	U	04/20/10	LFJ	EPA200.8
Lead, ug/l	0.01	10.0	0.1 J	6.3 J		1.2 J	0.3 J		0.8 J		04/20/10	LFJ	EPA200.8
Nickel, ug/l	0.05	50.0	2.3 J	0.9 J		1.1 J	0.5 J		0.4 J		04/20/10	LFJ	EPA200.8
Selenium, ug/l	0.32	10.0	0.3 J	---	U	---	U		---	U	04/20/10	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	0.1 J	0.1 J		0.1 J	0.1 J		---	U	04/20/10	LFJ	EPA200.8
Thallium, ug/l	0.05	5.0	0.1 J	---	U	0.1 J	0.1 J		---	U	04/20/10	LFJ	EPA200.8
Vanadium, ug/l	0.03	25.0	1 J	2.8 J		2 J	1 J		0.7 J		04/20/10	LFJ	EPA200.8
Zinc, ug/l	0.08	10.0	32	12		11	14		6.6 J		04/20/10	LFJ	EPA200.8

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

# Environment 1, Incorporated

Drinking Water ID: 37715  
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE  
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208  
FAX (252) 756-0633

CLIENT: AVERY COUNTY LANDFILL (OLD)  
MS. JOAN SMYTH  
RICHARDSON SMITH GARDNER  
133 SPRING AVENUE  
FUQUAY VARINA, NC 27526

CLIENT ID: 6056  
ANALYST: MAO  
DATE COLLECTED: 04/11/10  
DATE ANALYZED: 04/21/10  
DATE REPORTED: 05/07/10

Page: 1

REVIEWED BY: 

## VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	MW-1	MW-2	MW-3	SW-1	SW-2		
1. Chloromethane	0.77	1.0	---	U	---	U	---	U	
2. Vinyl Chloride	0.63	1.0	---	U	---	U	---	U	
3. Bromomethane	0.67	10.0	---	U	---	U	---	U	
4. Chloroethane	0.48	10.0	---	U	---	U	---	U	
5. Trichlorofluoromethane	0.24	1.0	---	U	---	U	---	U	
6. 1,1-Dichloroethene	0.17	5.0	---	U	---	U	---	U	
7. Acetone	9.06	100.0	---	U	---	U	---	U	
8. Iodomethane	0.26	10.0	---	U	---	U	---	U	
9. Carbon Disulfide	0.23	100.0	---	U	---	U	---	U	
10. Methylene Chloride	0.64	1.0	---	U	---	U	---	U	
11. trans-1,2-Dichloroethene	0.23	5.0	---	U	---	U	---	U	
12. 1,1-Dichloroethane	0.20	5.0	---	U	---	U	---	U	
13. Vinyl Acetate	0.20	50.0	---	U	---	U	---	U	
14. Cis-1,2-Dichloroethene	0.25	5.0	0.40 J	---	U	---	U	---	U
15. 2-Butanone	2.21	100.0	---	U	---	U	---	U	
16. Bromochloromethane	0.27	3.0	---	U	---	U	---	U	
17. Chloroform	0.25	5.0	---	U	---	U	---	U	
18. 1,1,1-Trichloroethane	0.19	1.0	---	U	---	U	---	U	
19. Carbon Tetrachloride	0.22	1.0	---	U	---	U	---	U	
20. Benzene	0.24	1.0	---	U	---	U	---	U	
21. 1,2-Dichloroethane	0.27	1.0	---	U	---	U	---	U	
22. Trichloroethene	0.23	1.0	---	U	---	U	---	U	
23. 1,2-Dichloropropane	0.21	1.0	---	U	---	U	---	U	
24. Bromodichloromethane	0.21	1.0	---	U	---	U	---	U	
25. Cis-1,3-Dichloropropene	0.24	1.0	---	U	---	U	---	U	
26. 4-Methyl-2-Pentanone	1.19	100.0	---	U	---	U	---	U	
27. Toluene	0.23	1.0	---	U	---	U	---	U	
28. trans-1,3-Dichloropropene	0.28	1.0	---	U	---	U	---	U	
29. 1,1,2-Trichloroethane	0.25	1.0	---	U	---	U	---	U	
30. Tetrachloroethene	0.17	1.0	---	U	---	U	---	U	
31. 2-Hexanone	1.57	50.0	---	U	---	U	---	U	
32. Dibromochloromethane	0.24	3.0	---	U	---	U	---	U	
33. 1,2-Dibromoethane	0.26	1.0	---	U	---	U	---	U	
34. Chlorobenzene	0.30	3.0	---	U	---	U	---	U	
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	---	U	---	U	---	U	
36. Ethylbenzene	0.21	1.0	---	U	---	U	---	U	
37. Xylenes	0.68	5.0	---	U	---	U	---	U	
38. Dibromomethane	0.28	10.0	---	U	---	U	---	U	
39. Styrene	0.19	1.0	---	U	---	U	---	U	
40. Bromoform	0.20	3.0	---	U	---	U	---	U	
41. 1,1,1,2,2-Tetrachloroethane	0.26	3.0	---	U	---	U	---	U	
42. 1,2,3-Trichloropropane	0.43	1.0	---	U	---	U	---	U	
43. 1,4-Dichlorobenzene	0.39	1.0	0.40 J	---	U	---	U	---	U
44. 1,2-Dichlorobenzene	0.32	5.0	---	U	---	U	---	U	
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	---	U	---	U	---	U	
46. Acrylonitrile	2.72	200.0	---	U	---	U	---	U	
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	---	U	---	U	---	U	

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

# Environment 1, Incorporated

Drinking Water ID: 37715

Wastewater ID: 10

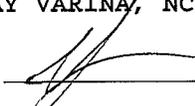
P.O. BOX 7085, 114 OAKMONT DRIVE  
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208  
FAX (252) 756-0633

CLIENT: AVERY COUNTY LANDFILL (OLD)  
MS. JOAN SMYTH  
RICHARDSON SMITH GARDNER  
133 SPRING AVENUE  
FUQUAY VARINA, NC 27526

CLIENT ID: 6056  
ANALYST: MAO  
DATE COLLECTED: 04/11/10  
DATE ANALYZED: 04/21/10  
DATE REPORTED: 05/07/10

Page: 2

REVIEWED BY: 

## VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Trip Blank
1. Chloromethane	0.77	1.0	--- U
2. Vinyl Chloride	0.63	1.0	--- U
3. Bromomethane	0.67	10.0	--- U
4. Chloroethane	0.48	10.0	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U
7. Acetone	9.06	100.0	--- U
8. Iodomethane	0.26	10.0	--- U
9. Carbon Disulfide	0.23	100.0	--- U
10. Methylene Chloride	0.64	1.0	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U
13. Vinyl Acetate	0.20	50.0	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U
15. 2-Butanone	2.21	100.0	--- U
16. Bromochloromethane	0.27	3.0	--- U
17. Chloroform	0.25	5.0	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U
20. Benzene	0.24	1.0	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U
22. Trichloroethene	0.23	1.0	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U
24. Bromodichloromethane	0.21	1.0	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U
27. Toluene	0.23	1.0	0.30 J
28. trans-1,3-Dichloropropene	0.28	1.0	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U
30. Tetrachloroethene	0.17	1.0	--- U
31. 2-Hexanone	1.57	50.0	--- U
32. Dibromochloromethane	0.24	3.0	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U
34. Chlorobenzene	0.30	3.0	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U
36. Ethylbenzene	0.21	1.0	--- U
37. Xylenes	0.68	5.0	--- U
38. Dibromomethane	0.28	10.0	--- U
39. Styrene	0.19	1.0	--- U
40. Bromoform	0.20	3.0	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U
46. Acrylonitrile	2.72	200.0	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Enviro, ment 1, Inc.  
 P.O. Box 7085, 114 Oakmont Dr.  
 Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CLIENT: 6056 Week: 13

AVERY COUNTY LANDFILL (OLD)  
 MS. JOAN SMYTH  
 RICHARDSON SMITH GARDNER  
 133 SPRING AVENUE  
 FUQUAY VARINA NC 27526

(919) 828-0577

**CHAIN OF CUSTODY RECORD**

SAMPLE LOCATION	COLLECTION		TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Metals			EPA 8260B	8260 Dup. 1	8260 Dup. 2	PARAMETERS
	DATE	TIME				A	E	E				
MW-1	4/11/10	3:21p			4							CLASSIFICATION: <input type="checkbox"/> WASTEWATER (NPDES) <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> DMQ/GW <input checked="" type="checkbox"/> SOLID WASTE SECTION  CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY <input checked="" type="checkbox"/> N SAMPLES COLLECTED BY: (Please Print) <b>DON MISENERNER</b> SAMPLES RECEIVED IN LAB AT <u>0.8</u> °C
MW-2	4/11/10	3:41p			3							
MW-3	4/11/10	3:50p			3							
SW-1	4/11/10	3:33p			3							
SW-2	4/11/10	4:00p			3							
Trip Blank					2							
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)
<i>Don Misenerner</i>	4/12/10 12:30p	<i>[Signature]</i>	4/13/10 9:55	<i>[Signature]</i>								
COMMENTS: CHLORINE NEUTRALIZED AT COLLECTION pH CHECK (LAB) CONTAINER TYPE, P/G CHEMICAL PRESERVATION A - NONE D - NaOH B - HNO <sub>3</sub> E - HCL C - H <sub>2</sub> SO <sub>4</sub> F - ZINC ACETATE G - NATHIOSULFATE												

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.  
 No 199517