

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)).
- In accordance with NC General Statutes Chapter 89C and 89E and NC Solid Waste Management Rules 15A NCAC 13B, be sure to affix a seal to the bottom of this page, when applicable.
- 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: Joan Smyth, P.G. Phone: 919-828-0577 x 122
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)
Closed Washington County MSW Landfill	Washington County Landfill 943 Washington Square Mall Plymouth, NC 27962	94-01	.0500	March 26, 2009

Environmental Status: (Check all that apply)

- Initial/Background Monitoring Detection Monitoring Assessment Monitoring Corrective Action

Type of data submitted: (Check all that apply)

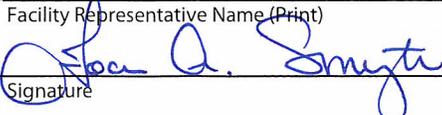
- Groundwater monitoring data from monitoring wells Methane gas monitoring data
 Groundwater monitoring data from private water supply wells Corrective action data (specify) _____
 Leachate monitoring data Other(specify) _____
 Surface water monitoring data

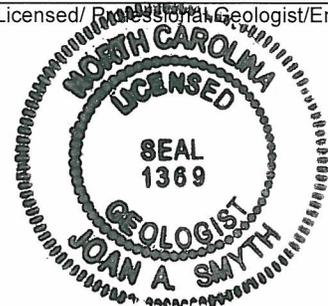
Notification attached?

- 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 Smyth, P.G. Senior Hydrogeologist 919-828-0577 x122
 Facility Representative Name (Print) Title (Area Code) Telephone Number
 Signature Date 5/13/09
 Affix NC Licensed/Professional Geologist/Engineer Seal here:



Washington County Closed MSW Landfill

Ground Water Monitoring Report

March 2009 Semi-annual Monitoring Event

**Washington County Closed MSW Landfill
Plymouth, North Carolina
NC Solid Waste Permit # 94-01-MSWLF-1980**

Prepared for:

Washington County
P.O. Box 1007
Plymouth, North Carolina 27962

May 2009



PRINTED ON 100% RECYCLED PAPER

Spring 2009 Ground Water Monitoring Report

**Washington County Closed MSW Landfill
Washington, North Carolina
NC Solid Waste Permit # 94-01 MSWLF-1980**

Prepared for:

**Washington County Solid Waste
943 Washington Square Mall
Plymouth, North Carolina 27962**

RSG Project No. **Wash 08-2**


Joan A. Smyth, P.G.
Senior Hydrogeologist



May 2009



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Washington County Closed MSW Landfill

**Semi-annual Ground Water Monitoring Report
March 2009 Event**

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Figure 1 – Washington County Landfill Site Map

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- Table 1 – Groundwater Elevations
- Table 2 – Field Parameter Results
- Table 3 – Detected Inorganic Constituents
- Table 4 – Detected Organic Constituents

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Appendix A – Laboratory Analytical Reports

1.0 Introduction

The Washington County Closed MSW Landfill, operating under Solid Waste Permit #94-01-MSWLF-1980 is required to submit semi-annual ground water monitoring reports for ground water monitoring. This report presents the results of the first semiannual monitoring event for 2009, conducted on March 26th, 2009.

This report includes summaries of the field procedures, laboratory analyses, and ground water characterization. Also included are laboratory analytical reports.

2.0 Sampling Procedures

The sampling event, performed by Environment 1, Inc. on March 26th, 2009, consisted of collecting samples from four (4) ground water wells (MW-1 through MW-4) in accordance with the approved site Sampling and Analysis Plan. Also included in the analysis were trip and field blanks for quality control.

Sampling methods followed the protocol outlined in the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities (North Carolina Department of Environment and Natural Resources, Division of Waste Management). The depth to water in each well was gauged prior to purging and sampling. Field measurements of pH, specific conductivity, and temperature were obtained from each well.

All samples were collected in laboratory prepared containers for the specified analytical procedures. Sampling equipment (Teflon bailers) were cleaned in the laboratory and transported to the site in aluminum foil. Ground water samples were properly preserved, placed on ice, and transported to the laboratory facility within the specified holding times for each analysis.

3.0 Field & Laboratory Results

3.1 Laboratory Analysis

The ground and surface water samples were transported to Environment 1, Inc., a North Carolina certified laboratory (NC Wastewater ID #10). Laboratory analysis consisted of the full suite of RCRA Subtitle D Appendix I constituents plus previously detected Appendix II constituents, and chloride. Parameters were reported at NC DWM Solid Waste Section Limits (SWSLs). The laboratory analytical report is included as **Appendix A**. No surface water samples are required for monitoring this site.

3.2 Field and Laboratory Results

The field parameter results are shown in **Table 1** while detected constituents are presented in **Tables 2** and **3**. Two (2) inorganic constituents, arsenic (MW-1 & MW-3) and barium (MW-1 & MW-2) were detected above the SWSL and shown in **Table 2**. These constituents were detected below the 2L ground water standards.

Three (3) organic constituents, benzene (MW-2), chlorobenzene (MW-2 & MW-3) and 1,4-dichlorobenzene (MW-2 and MW-3) were detected above the SWSLs . Of these, benzene (MW-2) and 1, 4-dichlorobenzene (MW-2) were detected at concentrations above the 2L standards.

Constituents detected below the SWSL are denoted as “J” values and are also included in **Tables 2 & 3**.

4.0 Ground Water Characterization

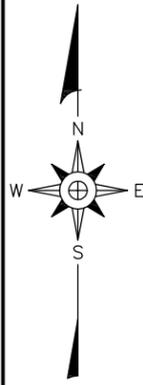
A potentiometric surface map was prepared from ground water elevation data collected during this sampling event. The data indicates that ground water is flowing to the Northeast direction. Hydraulic conductivity data is not available for these wells so ground water velocities could not be calculated.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

5.0 Conclusions

The data indicates relatively stable ground water quality at the Washington County Closed MSW Landfill. The next ground water monitoring event is scheduled for September 2009. Results will be reported upon completion of laboratory analysis.

Figures

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LEGEND

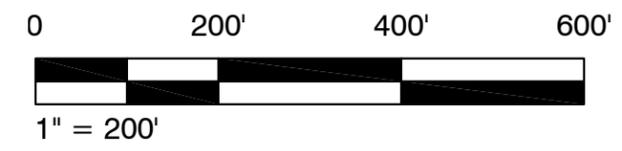
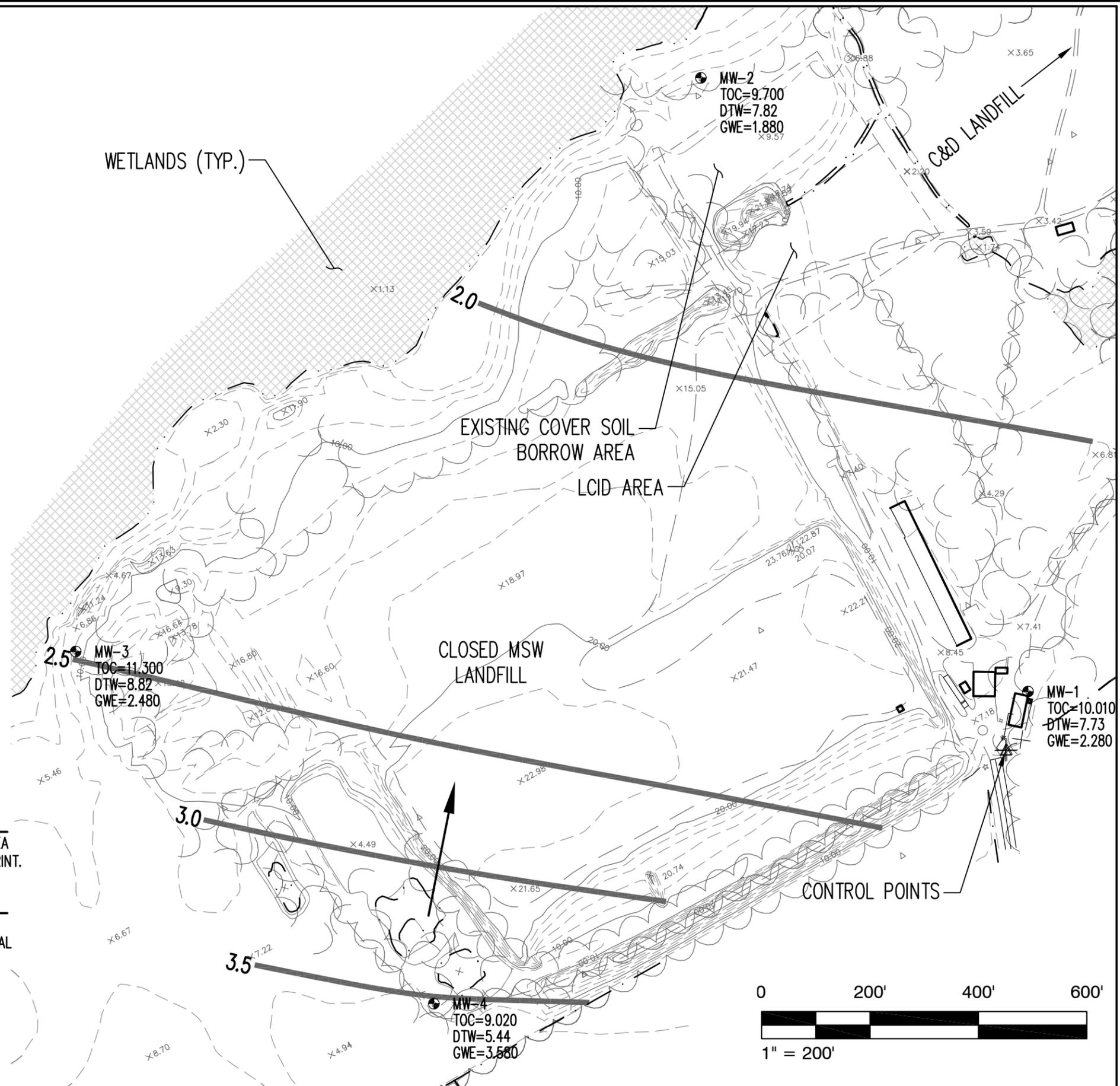
- EXISTING 10' CONTOUR (SEE REF 1)
- EXISTING 2' CONTOUR
- APPROXIMATE PROPERTY LINE
- STREAM/POND/DITCH BOUNDARY
- 2.0 POTENTIOMETRIC SURFACE
- WETLANDS BOUNDARY AREA (SEE REF 1)
- DIRECTION OF GROUNDWATER FLOW
- MW-1 MONITORING WELL
- CONTROL POINT

NOTES

1. THE TIRE MONOFILL IS NO LONGER USED BY THE COUNTY. THIS AREA WAS PREVIOUSLY INCORPORATED INTO THE C & D LANDFILL FOOTPRINT.

REFERENCES

1. OVERALL SITE BASE TOPOGRAPHY WETLAND, STREAM, AND DITCH BOUNDARIES PROVIDED BY SANBORN, BASED ON MAY 5, 2009 AERIAL SURVEY.
2. COORDINATE SYSTEM IS STATE PLANE GRID.
3. WELL LOCATIONS OBTAINED FROM FROM THE WASHINGTON COUNTY LANDFILL MONITOR WELL SURVEY REPORT DATED APRIL 24, 2009.



RICHARDSON SMITH GARDNER & ASSOCIATES
www.rsgengineers.com
14 N. Boylan Ave.
Raleigh, N.C. 27603
ph: 919-826-0577
fax: 919-826-3898

FIGURE NO.	1	FILE NAME	WASH-B0006
SCALE:	AS NOTED	PROJECT NO.	WASH 08-2
CHECKED BY:	J.A.S.	DATE:	May, 2009
DRAWN BY:	W.R.B.		

**WASHINGTON COUNTY
MSW LANDFILL
POTENTIOMETRIC SURFACE MAP
SPRING 2009**

Tables

Table 1
Field Parameter Results
Washington County MSW Landfill
3/23/2009

Well	Northing	Easting	TOC Elevation (feet)	Water Level (feet)	GW Elev (feet)
MW-1	797426.27	2691416.85	10.01	7.73	2.28
MW-2	798555.67	2690813.33	9.7	7.82	1.88
MW-3	797500.35	2689659.95	11.3	8.82	2.48
MW-4	796852.09	2690320.91	9.02	5.44	3.58

Table 2
Field Parameter Results
Washington County MSW Landfill
3/23/2009

Well	pH (Std units)	Spec Cond (umhos/cm)	Temp (celsius)	Static Water Level (feet)
MW-1	4.3	1074	15	7.23
MW-2	6.6	1337	17	7.82
MW-3	6.1	288	15	8.82
MW-4	5.1	103	14	5.44

Note: PH measured with a 'Hanna" pH/EC/TDS Meter, type HI9811
 Temperature measured with a laboratory grade thermometer.
 Data Collected by Environmental 1, Inc.



Table 3
Detected Inorganic Constituents
Washington County Closed MSW Landfill
3/23/2009

Parameter	SWSL	2L	MW-1	MW-2	MW-3	MW-4
Arsenic	10	50	15	6.3 J	11	3.5 J
Barium	100	2000	100	831	83.0 J	37.3 J
Cadmium	1	1.75	0.5 J	0.9 J	0.2 J	0.2 J
Total Chromium	10	50	3.7 J	1.9 J	1.1 J	2.4 J
Lead	10	15	2.9 J	1.9 J	0.3 J	1.4 J
Mercury	0.2	1.05	0.04 J	0.14 J	0.01 J	0.02 J
Selenium	10	50	5.4 J	1.4 J	0.7 J	0.3 J

- 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.



**Table 4
Detected Organic Constituents
Washington County Closed MSW Landfill
3/23/2009**

Parameter	SWSL	2L	MW-1	MW-2	MW-3	MW-4
Acetone	100.0	700	ND	1.5 J	ND	ND
Vinyl Chloride	1.0	0.015	ND	0.6 J	ND	ND
Benzene	1	1	ND	1.2	0.3 J	ND
2-Butanone	100.0	4200	ND	ND	ND	ND
Chlorobenzene	3.0	50	ND	4.7	5.3	ND
Chloromethane	1.0	2.6	ND	ND	ND	ND
1, 4-Dichlorobenzene	1.0	1.4	ND	3.1	1.2	ND
1, 2-Dichlorobenzene	5.0	24	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.

Appendix A

Laboratory Analytical Report

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

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

ID#: 6018

WASHINGTON CO. LANDFILL
MR. CARL CRITCHER
P.O. BOX 1007
PLYMOUTH ,NC 27962

DATE COLLECTED: 03/26/09
DATE REPORTED : 04/09/09

REVIEWED BY: 

PARAMETERS	MDL	SWSL	Well	Well	Well	Well	Analysis		Method
			#1	#2	#3	#4	Date	Analyst	Code
PH (field measurement), Units			4.3	6.6	6.1	5.1	03/26/09	RJH	SM4500HB
Arsenic, ug/l	0.07	10.0	15	6.3 J	11	3.5 J	04/01/09	CMF	EPA200.8
Barium, ug/l	0.11	100.0	100	831	83.0 J	37.3 J	04/01/09	CMF	EPA200.8
Cadmium, ug/l	0.04	1.0	0.5 J	0.9 J	0.2 J	0.2 J	04/01/09	CMF	EPA200.8
Total Chromium, ug/l	0.11	10.0	3.7 J	1.9 J	1.1 J	2.4 J	04/01/09	CMF	EPA200.8
Lead, ug/l	0.04	10.0	2.9 J	1.9 J	0.3 J	1.4 J	04/01/09	CMF	EPA200.8
Mercury, ug/l	0.01	0.20	0.04 J	0.14 J	0.01 J	0.02 J	04/01/09	CMF	EPA200.8
Selenium, ug/l	0.14	10.0	5.4 J	1.4 J	0.7 J	0.3 J	04/01/09	CMF	EPA200.8
Silver, ug/l	0.04	10.0	--- U	--- U	--- U	--- U	04/01/09	CMF	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	1074	1337	288	103	03/26/09	RJH	SM2510B
Temperature, °C			15	17	15	14	03/26/09	RJH	SM2550B
Static Water Level, feet			7.23	7.82	8.82	5.44	03/26/09	RJH	
Well Depth, feet			23.09	19.30	19.97	22.90	03/26/09	RJH	

Environment 1, Incorporated

Drinking Water ID: 3715
Wastewater ID: 10

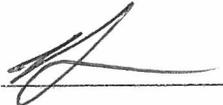
P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

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

CLIENT: WASHINGTON CO. LANDFILL
MR. CARL CRITCHER
P.O. BOX 1007
PLYMOUTH, NC 27962

CLIENT ID: 6018
ANALYST: MAO
DATE COLLECTED: 03/26/09
DATE ANALYZED: 04/02/09
DATE REPORTED: 04/09/09

Page: 1

REVIEWED BY: 

VOLATILE ORGANICS EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Well #1	Well #2	Well #3	Well #4
1. Chloromethane	0.18	1.0	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.34	1.0	--- U	0.60 J	--- U	--- U
3. Bromomethane	0.26	10.0	--- U	--- U	--- U	--- U
4. Chloroethane	0.29	10.0	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.13	1.0	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.14	5.0	--- U	--- U	--- U	--- U
7. Acetone	1.21	100.0	--- U	1.50 J	--- U	--- U
8. Iodomethane	0.12	10.0	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.14	100.0	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.14	1.0	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.13	5.0	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.16	5.0	--- U	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.14	5.0	--- U	--- U	--- U	--- U
15. 2-Butanone	0.85	100.0	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.11	3.0	--- U	--- U	--- U	--- U
17. Chloroform	0.13	5.0	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.11	1.0	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.13	1.0	--- U	--- U	--- U	--- U
20. Benzene	0.16	1.0	--- U	1.20	0.30 J	--- U
21. 1,2-Dichloroethane	0.12	1.0	--- U	--- U	--- U	--- U
22. Trichloroethene	0.13	1.0	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.17	1.0	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.13	1.0	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.17	1.0	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	0.68	100.0	--- U	--- U	--- U	--- U
27. Toluene	0.13	1.0	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.14	1.0	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.20	1.0	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.16	1.0	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.00	50.0	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.14	3.0	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.13	1.0	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.13	3.0	--- U	4.70	5.30	--- U
35. 1,1,1,2-Tetrachloroethane	0.14	5.0	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.16	1.0	--- U	--- U	--- U	--- U
37. Xylenes	0.48	5.0	--- U	--- U	--- U	--- U
38. Dibromomethane	0.17	10.0	--- U	--- U	--- U	--- U
39. Styrene	0.16	1.0	--- U	--- U	--- U	--- U
40. Bromoform	0.11	3.0	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.16	3.0	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.06	1.0	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.21	1.0	--- U	3.10	1.20	--- U
44. 1,2-Dichlorobenzene	0.13	5.0	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.26	13.0	--- U	--- U	--- U	--- U
46. Acrylonitrile	1.49	200.0	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.14	100.0	--- U	--- U	--- U	--- U

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

