Semi-Annual Water Quality Monitoring Report

Prepared for

Hertford County Closed Unlined MSWLF
Winton, North Carolina

June 2011

Permit Number: 46-01
MESCO Project Number: G10012.0

Submitted on September 20, 2011

P.O. BOX 97
Garner, NC 27529
License No. C-0281

Municipal Services Garner, NC
Engineering Company, P.A. Boone, NC
Municipal Engineering Services Company, P.A.
Garner, Boone and Morehead City, North Carolina

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):

Municipal Engineering Services Co., PA

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

Name: Jonathan Pfohl Phone: (919)772-5393

E-mail: jpfohl@mesco.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Hertford County Closed Unlined MSWLF	227 Mount Moriah Road Winton, NC 27986	46-01	.0500	June 7, 2011

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
☐ Groundwater monitoring data from private water supply wells
☐ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ 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.

Madeline German — Licensed Geologist — (919) 772-5393

Facility Representative Name (Print) — Title — (Area Code) Telephone Number

Signature — Date: 9/20/2011

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 2275 GEOLOGIST MADELINE GERMAN 9/20/2011

P.O. BOX 97, Garner, NC 27529

Facility Representative Address

C-0281

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

Revised 6/2009

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OPERATION/CONSTRUCTION MANAGERS

Municipal Services

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

September 20, 2011

Mr. Ervin Lane
Solid Waste Section (SWS)
Division of Waste Management
North Carolina Department of Environment and Natural Resources (NCDENR)
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Semi-Annual Water Quality Monitoring Report
Hertford County Closed Unlined Landfill
Permit No. 46-01
MESCO Project No. G10012.0

Dear Mr. Lane:

Introduction

The Hertford County Closed Unlined MSWLF located near Winton, NC, which operated under permit #46-01, is required to submit semi-annual compliance reports as a condition of 15A NCAC 13B .0500. This water quality monitoring event was reportedly performed by Environment 1 Incorporated (E1) personnel of Greenville NC on June 7, 2011 in accordance with the semi-annual monitoring schedule prescribed by the NC Solid Waste Section (SWS) rules/regulations. The latest semi-annual sampling event results indicate volatile organic compounds (VOCs) continue to persist within the surficial aquifer at the closed MSWLF, but natural attenuation processes continue to be observed.

The water quality monitoring program includes sampling locations outlined in the approved, site specific Sampling and Analysis Plan (SAP), contained in the facility *Transition Plan,* dated November 1995. As specified in SWS rules and the SWS Environmental Monitoring Report Form this report contains sampling procedures, field and laboratory results, groundwater and surface water characterization, and findings. A detections compared to standards table, groundwater flow directions/rates table, groundwater single-day potentiometric map, quality assurance/quality control data, and laboratory analytical data results are also enclosed.

Sampling Procedure

E1 performed the collection and laboratory analysis of water samples for this event. Water samples were reportedly collected from thirteen groundwater monitoring wells (MW-A through MW-M) and three surface waters (SW-1 through SW-4). Quality control measures were also implemented during this event which included submittal and subsequent quantification of equipment and travel blanks (EB and TB). Monitoring locations are shown on the enclosed single-day potentiometric map (**Plate 1**).

Sampling was reported to be performed utilizing methodology outlined in the NCDENR *Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling* revised April 2008. The depth to water in each well was gaged prior to purging to quantify the static water level and used to construct the attached potentiometric map. Collected samples were transported under chain-of-custody (C-O-C) protocols within the specified hold times for each analysis. Field parameters (pH, specific conductance and temperature) were recorded.

PO Box 97, Garner, North Carolina 27529 (919) 772-5393
PO Box 828, Morehead City, NC 28557 (252) 726-9481 PO Box 349, Boone, North Carolina 28607 (828) 262-1767

Laboratory Results

Groundwater samples and EB were analyzed for the Appendix I list of VOCs by method EPA 8260B, Appendix I total unfiltered metals and mercury via EPA 200.8. The surface waters were analyzed for the same parameters and methods except mercury was not a target analyte. Quality control sample TB was tested for Appendix I VOCs.

Water samples were reported to laboratory specific Method Detection Limits (MDL) which are quantifiable at or below the current Solid Waste Section detection limits (SWSL). **Table 1** summarizes constituents detected in the water samples in concentrations above the current SWSL, Groundwater Protection Standards (GWP), North Carolina Groundwater Standards (2L) or the North Carolina Surface Water Standards (2B) for a Class C water body. Laboratory results and C-O-Cs are presented in **Appendix A**.

Quality Control Samples

A few metals were detected in non-quantifiable concentrations in EB. It appears the laboratory/field induced artifact contamination had no effect on the validity of the data set.

Groundwater Samples

The only total undissolved metal detected above its respective 2L Standard was barium in downgradient MW-H. One or more VOCs were detected in concentrations above their respective 2L Standard(s) in MW-A, MW-B, MW-D, MW-E, MW-F, MW-G, MW-H, MW-I, MW-J, and MW-L. Vinyl chloride, a common biodegradation byproduct of reductive dechlorination, continues to be the most prevalently detected contaminant. Constituents detected in levels above the 2L Standard during this event have previously been found at their respective locations and concentrations remain within their respective historically identifiable range.

Surfacewater Samples

Total cobalt, thallium and vinyl chloride were detected in SW-3 in concentrations above the applicable 2B Standard. Surface water point SW-3 is located along Potecasi Creek upstream from the facility; therefore these detections are not attributed to landfill activities.

Field Parameter Data

The field parameter data is presented with the laboratory report in **Appendix A**.

Groundwater and Surface Water Characterization

A single-day potentiometric map constructed from groundwater elevation data obtained by E1 during this event, is presented as **Plate 1**. Groundwater flow rates and directions were calculated and are included on **Table 2**. Groundwater in the surficial aquifer flows in a general north/northwestern direction towards Potecasi Creek. Groundwater velocities, calculated using equipotential contours, ranged from approximately <1ft./yr. (MW-C) to 127 ft./yr. (MW-F), averaging approximately 35 ft./yr. The flow directions and gradients are consistent with historical observations.

Findings

Results from the latest semi-annual sampling event indicate that VOCs continue to persist in the surficial aquifer. Landfill gas has previously been detected at the facility and may be contributing to the lower level dissolved VOCs in the groundwater, especially in MW-A, MW-B and MW-G which are located hydraulically upgradient of the waste boundary. Laboratory analysis indicates the local discharge features downgradient of the facility remain un-impacted. The facility is located in a rural setting and the residents in closest proximity to the property boundary are connected to municipal water, limiting the potential of human exposure to groundwater.

Closing

Water quality monitoring at the facility will continue and the next event is tentatively scheduled for December 2011. If you have any questions or comments regarding this report, please contact us by phone at (919) 772-5393 or by email at jpfohl@mesco.com or mgerman@mesco.com.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

Jonathan Pfohl
Environmental Specialist

Madeline German, PG
Professional Geologist

NORTH CAROLINA LICENSED SEAL 2275 GEOLOGIST MADELINE GERMAN 9/20/2011

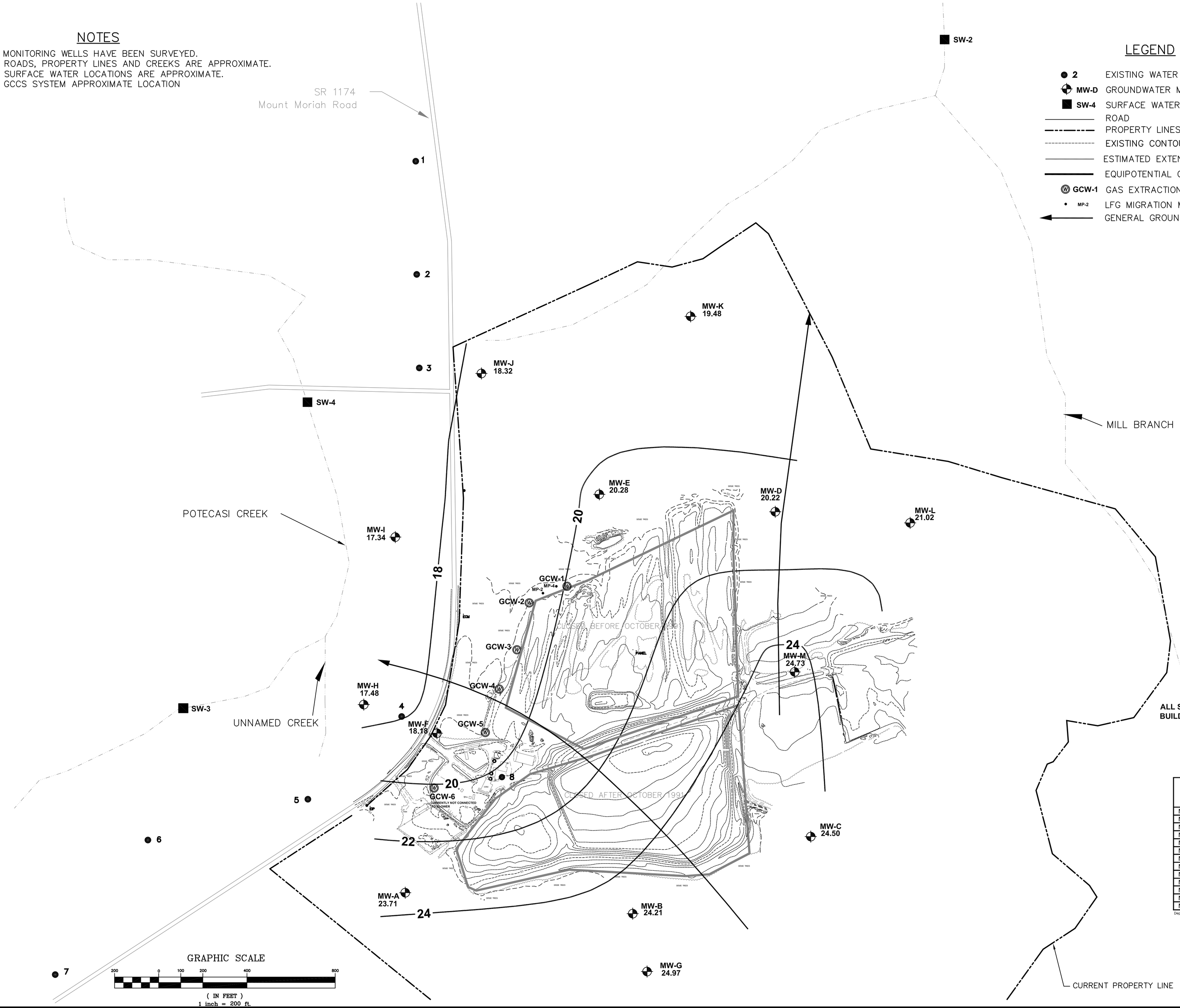
Enclosures

cc: Mr. Melvin Nichols
Hertford County

Figures

NOTES

1. MONITORING WELLS HAVE BEEN SURVEYED.
2. ROADS, PROPERTY LINES AND CREEKS ARE APPROXIMATE.
3. SURFACE WATER LOCATIONS ARE APPROXIMATE.
4. GCCS SYSTEM APPROXIMATE LOCATION



LEGEND

- 2 — EXISTING WATER SUPPLY WELL
- MW-D — GROUNDWATER MONITORING WELL
- SW-4 — SURFACE WATER SAMPLING LOCATION
- ROAD
- PROPERTY LINES
- EXISTING CONTOUR
- ESTIMATED EXTENT OF WASTE
- EQUIPOTENTIAL GROUNDWATER CONTOURS
- GCW-1 — GAS EXTRACTION WELLS
- MP-2 — LFG MIGRATION MONITORING PROBES
- GENERAL GROUNDWATER FLOW DIRECTION

WATER SUPPLY WELLS
1. Howard Godwin
2. John Eley
3. Hattie Casey
4. Mt. Moriah Church
5. Small Frame House
6. Arthur Williams
7. Armstead Sharp
8. Landfill

ALL SUPPLY WELLS REPORTEDLY NOT IN USE.
BUILDINGS NOW CONNECTED TO MUNICIPAL WATER.

WELL #	TOP OF CASING ELEVATION (FT AMSL)	DEPTH TO GROUNDWATER (FT BTOC)	GROUNDWATER POTENTIOMETRIC ELEVATION (FT AMSL)
MW-A	50.25	26.54	23.71
MW-B	49.77	25.56	24.21
MW-C	45.58	21.08	24.50
MW-D	48.31	28.09	20.22
MW-E	47.86	27.58	20.28
MW-F	49.49	31.31	18.18
MW-G	50.10	25.13	24.97
MW-H	45.46	27.98	17.48
MW-I	48.00	30.66	17.34
MW-J	46.26	27.94	18.32
MW-K	48.81	29.33	19.48
MW-L	46.41	25.39	21.02
MW-M	47.77	23.04	24.73

Depth to groundwater recorded by Environment 1 Incorporated personnel on June 6, 2011

PLATE 1

Municipal Engineering Services Company, P.A.
LICENSE #C-0281
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 27529 (704) 262-1767

MUNICIPAL SOLID WASTE LANDFILL FACILITY
HERTFORD COUNTY NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

SINGLE DAY POTENTIOMETRIC MAP UPPERMOST AQUIFER

SCALE: 1" = 200'
DATE: 9/15/11
DRWN. BY: J. PFOHL
CHKD. BY: M. GERMAN
PROJECT NUMBER: G10012.0
DRAWING NO.: PLATE 1
SHEET NO.: 1 OF 1

Tables

Table 1
Detections in Water Samples that Attain or Exceed SWSL, GWP, 2L or 2B
June 7, 2011

Sample ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause [7]
MW-A	**Benzene**	**06/07/2011**	**1.5**	**ug/l**	**0.24**	**1**	**1**			**0.5**	**L &/or LFG**
MW-A	**Vinyl Chloride**	**06/07/2011**	**1**	**ug/l**	**0.63**	**1**	**0.03**			**0.97**	**L &/or LFG**
MW-A	Cobalt	06/07/2011	124	ug/l	0.03	10			70	54	
MW-A	Barium	06/07/2011	156	ug/l	0.02	100	700				
MW-A	Chlorobenzene	06/07/2011	5	ug/l	0.3	3	50				
MW-A	1,4-Dichlorobenzene	06/07/2011	1.2	ug/l	0.39	1	6				
MW-B	**Trichloroethene**	**06/07/2011**	**4.6**	**ug/l**	**0.23**	**1**	**3**			**1.6**	**L &/or LFG**
MW-B	**Vinyl Chloride**	**06/07/2011**	**7.7**	**ug/l**	**0.63**	**1**	**0.03**			**7.67**	**L &/or LFG**
MW-B	Cobalt	06/07/2011	153	ug/l	0.03	10			70	83	
MW-B	Barium	06/07/2011	154	ug/l	0.02	100	700				
MW-B	Cis-1,2-Dichloroethene	06/07/2011	8.8	ug/l	0.25	5	70				
MW-B	Zinc	06/07/2011	11	ug/l	0.24	10	1050				
MW-C	Beryllium	06/07/2011	1	ug/l	0.02	1			4		
MW-C	Zinc	06/07/2011	31	ug/l	0.24	10	1050				
MW-D	**Vinyl Chloride**	**06/07/2011**	**1.6**	**ug/l**	**0.63**	**1**	**0.03**			**1.57**	**L &/or LFG**
MW-D	Vanadium	06/07/2011	7.6 j	ug/l	0.14	25			3.5	4.1	
MW-D	Cobalt	06/07/2011	55	ug/l	0.03	10			70		
MW-D	Zinc	06/07/2011	50	ug/l	0.24	10	1050				
MW-D	Barium	06/07/2011	124	ug/l	0.02	100	700				
MW-E	**Vinyl Chloride**	**06/07/2011**	**1.2**	**ug/l**	**0.63**	**1**	**0.03**			**1.17**	**L &/or LFG**
MW-E	**Benzene**	**06/07/2011**	**2.5**	**ug/l**	**0.24**	**1**	**1**			**1.5**	**L &/or LFG**
MW-E	1,4-Dichlorobenzene	06/07/2011	3.6	ug/l	0.39	1	6				
MW-E	Chlorobenzene	06/07/2011	17.2	ug/l	0.3	3	50				
MW-E	Barium	06/07/2011	121	ug/l	0.02	100	700				
MW-E	Cobalt	06/07/2011	37	ug/l	0.03	10			70		
MW-F	**Benzene**	**06/07/2011**	**3.1**	**ug/l**	**0.24**	**1**	**1**			**2.1**	**L &/or LFG**
MW-F	**Vinyl Chloride**	**06/07/2011**	**9.9**	**ug/l**	**0.63**	**1**	**0.03**			**9.87**	**L &/or LFG**
MW-F	Cobalt	06/07/2011	144	ug/l	0.03	10			70	74	
MW-F	Chlorobenzene	06/07/2011	17.2	ug/l	0.3	3	50				
MW-F	Cis-1,2-Dichloroethene	06/07/2011	40.6	ug/l	0.25	5	70				
MW-F	Barium	06/07/2011	471	ug/l	0.02	100	700				
MW-F	Trichloroethene	06/07/2011	1.4	ug/l	0.23	1	3				
MW-F	1,4-Dichlorobenzene	06/07/2011	5.2	ug/l	0.39	1	6				

Sample ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause [7]
MW-G	**Vinyl Chloride**	**06/07/2011**	**2.2**	**ug/l**	**0.63**	**1**	**0.03**			**2.17**	**L &/or LFG**
MW-G	Barium	06/07/2011	119	ug/l	0.02	100	700				
MW-G	Zinc	06/07/2011	21	ug/l	0.24	10	1050				
MW-H	**Vinyl Chloride**	**06/07/2011**	**1.3**	**ug/l**	**0.63**	**1**	**0.03**			**1.27**	**L &/or LFG**
MW-H	Thallium	06/07/2011	2.2 j	ug/l	0.02	5.5			0.28	1.92	
MW-H	**Barium**	**06/07/2011**	**840**	**ug/l**	**0.02**	**100**	**700**			**140**	**N**
MW-H	Cobalt	06/07/2011	309	ug/l	0.03	10			70	239	
MW-H	1,4-Dichlorobenzene	06/07/2011	1.1	ug/l	0.39	1	6				
MW-H	Cis-1,2-Dichloroethene	06/07/2011	9.2	ug/l	0.25	5	70				
MW-H	Chlorobenzene	06/07/2011	4.3	ug/l	0.3	3	50				
MW-H	Nickel	06/07/2011	64	ug/l	0.04	50	100				
MW-I	**1,4-Dichlorobenzene**	**06/07/2011**	**6.5**	**ug/l**	**0.39**	**1**	**6**			**0.5**	**L &/or LFG**
MW-I	**Benzene**	**06/07/2011**	**3.7**	**ug/l**	**0.24**	**1**	**1**			**2.7**	**L &/or LFG**
MW-I	**Vinyl Chloride**	**06/07/2011**	**12.8**	**ug/l**	**0.63**	**1**	**0.03**			**12.77**	**L &/or LFG**
MW-I	Cis-1,2-Dichloroethene	06/07/2011	5.9	ug/l	0.25	5	70				
MW-I	Cobalt	06/07/2011	70	ug/l	0.03	10			70		
MW-I	Chlorobenzene	06/07/2011	23.6	ug/l	0.3	3	50				
MW-I	Barium	06/07/2011	220	ug/l	0.02	100	700				
MW-I	Zinc	06/07/2011	21	ug/l	0.24	10	1050				
MW-J	**Vinyl Chloride**	**06/07/2011**	**2.1**	**ug/l**	**0.63**	**1**	**0.03**			**2.07**	**L &/or LFG**
MW-J	Zinc	06/07/2011	13	ug/l	0.24	10	1050				
MW-K	Zinc	06/07/2011	12	ug/l	0.24	10	1050				
MW-L	**Benzene**	**06/07/2011**	**1.1**	**ug/l**	**0.24**	**1**	**1**			**0.1**	**L &/or LFG**
MW-L	**Vinyl Chloride**	**06/07/2011**	**1.7**	**ug/l**	**0.63**	**1**	**0.03**			**1.67**	**L &/or LFG**
MW-L	Cobalt	06/07/2011	76	ug/l	0.03	10			70	6	
MW-L	Barium	06/07/2011	113	ug/l	0.02	100	700				
MW-L	Zinc	06/07/2011	33	ug/l	0.24	10	1050				
MW-L	1,4-Dichlorobenzene	06/07/2011	1.2	ug/l	0.39	1	6				

Sample ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause [7]
SW-1	Cobalt	06/07/2011	13	ug/l	0.03	10		270			
SW-1	Vanadium	06/07/2011	5.1	ug/l	0.14	25		NE			
SW-1	Zinc	06/07/2011	11	ug/l	0.24	10		50			
SW-2	Cobalt	06/07/2011	13	ug/l	0.03	10		270			
SW-3	Zinc	06/07/2011	48	ug/l	0.24	10		50			
SW-3	Nickel	06/07/2011	62	ug/l	0.04	50		88			
SW-3	1,4-Dichlorobenzene	06/07/2011	2.3	ug/l	0.39	1		100			
SW-3	**Vinyl Chloride**	**06/07/2011**	**4.1**	**ug/l**	**0.63**	**1**		**2.4**		**1.7**	**B (Upstream)**
SW-3	Barium	06/07/2011	1768	ug/l	0.02	100		200000			
SW-3	Benzene	06/07/2011	1	ug/l	0.24	1	1			50	
SW-3	Cis-1,2-Dichloroethene	06/07/2011	11.3	ug/l	0.25	5		4900			
SW-3	Chlorobenzene	06/07/2011	9	ug/l	0.3	3		140			
SW-3	**Cobalt**	**06/07/2011**	**363**	**ug/l**	**0.03**	**10**		**270**		**93**	**B (Upstream)**
SW-3	**Thallium**	**06/07/2011**	**1 j**	**ug/l**	**0.02**	**5.5**		**0.47**		**0.53**	**B (Upstream)**
SW-4	Zinc	06/07/2011	42	ug/l	0.24	10		50			
SW-4	Vanadium	06/07/2011	5.9 j	ug/l	0.14	25		NE			
SW-4	Barium	06/07/2011	415	ug/l	0.02	100		200000			
SW-4	Cobalt	06/07/2011	37	ug/l	0.03	10		270			

[1] Table contains constituents detected at or above SWSL, GWP, 2L, or 2B

[2] MDL = Method Detection Limit

[3] SWSL = Solid Waste Section Reporting Limit

[4] 2L = North Carolina 15A NCAC 2L Groundwater Quality Standard

[5] 2B = North Carolina 15 NCAC 2B Surface Water Quality Standard for this Specific Stream Classification

[6] GWP = Groundwater Protection Standard

j =The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable

[7] Preliminary Cause = Refers to a preliminary analysis of the cause and/or source of a detection over the respective 2L/2B Standard. A definitive source of the detection was not determined as part of this report.

L = Leachate

LFG = Landfill Gas

N = Natural from erosion of natural deposits

B = Background (upgradient or upstream of MSWLF)

BOLD = Concentration > 2L, or 2B Standard

Table 2
Hydrologic Properties at Monitoring Well Locations
June 7, 2011

Monitoring Location	Hydraulic Conductivity (cm/second)	Effective Porosity (%)	Hydraulic Gradient (feet/feet)	Groundwater Average Linear Velocity Rate (feet/year)	Flow Direction	Depth to Groundwater (ft btoc)	Groundwater Potentiometric Elevation (ft amsl)	Screened Interval Lithology	Direction in Relation to MSWLF Boundary
MW-A	7.30E-04	20	0.0029	11	N06W	26.54	23.71	Sand	Crossgradient
MW-B	6.90E-04	20	0.0012	4	N33W	25.56	24.21	Sand	Upgradient
MW-C	1.10E-04	20	0.0009	0.5	N56W	21.08	24.50	Clayey Sand	Upgradient
MW-D	4.40E-04	20	0.0068	16	N00W	28.09	20.22	Clayey Silt	Downgradient
MW-E	3.10E-03	20	0.0034	54	N66W	27.58	20.28	Sand	Downgradient
MW-F	3.10E-03	20	0.0079	127	N04W	31.31	18.18	Clayey Sand	Downgradient
MW-G	1.80E-03	20	0.0022	20	N28W	25.13	24.97	Sand	Upgradient
MW-H	4.60E-03	20	0.0052	124	N13W	27.98	17.48	Sand	Downgradient
MW-I	1.10E-03	20	0.0032	18	N82W	30.66	17.34	Sand	Downgradient
MW-J	1.20E-03	20	0.0035	22	N80W	27.94	18.32	Sand	Downgradient
MW-K	3.50E-03	20	0.0009	16	N01W	29.33	19.48	Sand	Downgradient
MW-L	1.60E-04	20	0.0031	3	N35W	25.39	21.02	Sand	Downgradient
MW-M	1.20E-03	20	0.0062	38	N06W	23.04	24.73	Sand	Crossgradient
Minimum	1.10E-04	20	0.0009	0.5	-	21.08	17.34	-	-
Average	1.67E-03	20	0.0036	35	-	26.89	21.11	-	-
Maximum	7.30E-04	20	0.0079	127	-	31.31	24.97	-	-

NOTE: Values for effective porosity & hydraulic conductivity obtained from GAI Consultants' *Assessment Report* (Feb. 1996).
Hydrologic Gradient from groundwater elevations recorded on June 7, 2011.
Average linear velocity rate (Q) is defined by the equation:

where

$$Q = -\frac{K}{n_e} \cdot \frac{dh}{dl}$$

K = hydraulic conductivity
n_e = effective porosity
dh = head difference
dl = horizontal distance

Appendix A
Laboratory Analysis Reports
Field Paramater Data
Chains of Custody

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#: 6025

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER ,NC 27529

DATE COLLECTED: 06/07/11
DATE REPORTED : 06/24/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-A	MW-B	MW-C	MW-D	MW-E	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.0	6.1	5.1	5.7	5.9	06/07/11	RJH	SM4500HB
Antimony, ug/l	0.14	6.0	--- U	--- U	--- U	--- U	--- U	06/13/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0	3.8 J	9 J	--- U	2.0 J	5.4 J	06/13/11	CMF	EPA200.8
Barium, ug/l	0.02	100.0	156	154	82.3 J	124	121	06/13/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.06 J	0.14 J	1	0.35 J	--- U	06/13/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.11 J	0.09 J	0.12 J	0.18 J	--- U	06/13/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0	124	153	7.9 J	55	37	06/13/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0	1.4 J	1.7 J	0.78 J	2.7 J	0.45 J	06/13/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0	--- U	1.9 J	0.20 J	4.6 J	--- U	06/13/11	CMF	EPA200.8
Lead, ug/l	0.02	10.0	0.28 J	0.74 J	0.21 J	1.2 J	0.12 J	06/13/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20	0.12 J	--- U	--- U	--- U	--- U	06/13/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0	4.9 J	14.0 J	6.3 J	8.2 J	2.5 J	06/13/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0	0.25 J	0.36 J	0.38 J	0.40 J	--- U	06/13/11	CMF	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U	--- U	06/13/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5	0.03 J	--- U	--- U	0.05 J	0.03 J	06/13/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0	1.0 J	3.5 J	1.3 J	7.6 J	0.94 J	06/13/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0	4.7 J	11	31	50	4.8 J	06/13/11	CMF	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	608	422	65	356	472	06/07/11	RJH	SM2510B
Temperature, °C			19	18	17	18	21	06/07/11	RJH	SM2550B
Static Water Level, feet			26.54	25.56	21.08	28.09	27.58	06/07/11	RJH	
Well Depth, feet			30.41	28.85	25.20	35.49	35.39	06/07/11	RJH	

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

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
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ID#: 6025

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER ,NC 27529

DATE COLLECTED: 06/07/11
DATE REPORTED : 06/24/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-F	MW-G	MW-H	MW-I	MW-J	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.3	6.0	6.4	5.9	5.7	06/07/11	RJH	SM4500HB
Antimony, ug/l	0.14	6.0	--- U	--- U	--- U	--- U	--- U	06/13/11	CMF	EPA200.8
Arsenic, ug/l	0.10	10.0	3.0 J	0.98 J	1.8 J	2.9 J	0.59 J	06/13/11	CMF	EPA200.8
Barium, ug/l	0.02	100.0	471	119	840	220	82.0 J	06/13/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.12 J	0.13 J	0.06 J	0.12 J	0.14 J	06/13/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.07 J	0.11 J	0.07 J	0.06 J	0.37 J	06/13/11	CMF	EPA200.8
Cobalt, ug/l	0.03	10.0	144	5.6 J	309	70	6.9 J	06/13/11	CMF	EPA200.8
Copper, ug/l	0.02	10.0	0.17 J	1.4 J	0.62 J	0.90 J	1.6 J	06/13/11	CMF	EPA200.8
Total Chromium, ug/l	0.04	10.0	--- U	--- U	--- U	--- U	1.5 J	06/13/11	CMF	EPA200.8
Lead, ug/l	0.02	10.0	--- U	0.22 J	0.07 J	0.12 J	0.21 J	06/13/11	CMF	EPA200.8
Mercury, ug/l	0.05	0.20	0.07 J	--- U	0.05 J	0.11 J	0.09 J	06/13/11	CMF	EPA200.8
Nickel, ug/l	0.04	50.0	9.1 J	9.1 J	64	7.5 J	5.2 J	06/13/11	CMF	EPA200.8
Selenium, ug/l	0.20	10.0	0.40 J	0.61 J	--- U	1.1 J	1.2 J	06/13/11	CMF	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U	--- U	06/13/11	CMF	EPA200.8
Thallium, ug/l	0.02	5.5	0.12 J	0.12 J	2.2 J	0.14 J	0.06 J	06/13/11	CMF	EPA200.8
Vanadium, ug/l	0.14	25.0	0.61 J	0.83 J	--- U	--- U	0.87 J	06/13/11	CMF	EPA200.8
Zinc, ug/l	0.24	10.0	4.0 J	21	6.0 J	21	13	06/13/11	CMF	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	1046	305	567	541	205	06/07/11	RJH	SM2510B
Temperature, °C			21	18	18	18	17	06/07/11	RJH	SM2550B
Static Water Level, feet			31.31	25.13	27.98	30.66	27.94	06/07/11	RJH	
Well Depth, feet			35.28	39.65	37.11	36.47	38.45	06/07/11	RJH	

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ID#: 6025

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER ,NC 27529

DATE COLLECTED: 06/07/11
DATE REPORTED : 06/24/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-K	MW-L	MW-M	Equipment Blank	Trip Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units			5.9	5.7	5.4			06/07/11	RJH	SM4500HB
Antimony, ug/l	0.14	6.0	--- U	--- U	--- U	--- U		06/14/11	LFJ	EPA200.8
Arsenic, ug/l	0.10	10.0	0.31 J	1.4 J	--- U	--- U		06/14/11	LFJ	EPA200.8
Barium, ug/l	0.02	100.0	40.0 J	113	87.5 J	0.22 J		06/14/11	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	--- U	0.19 J	0.27 J	--- U		06/14/11	LFJ	EPA200.8
Cadmium, ug/l	0.02	1.0	0.22 J	0.15 J	0.07 J	--- U		06/14/11	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	0.10 J	76	2.8 J	0.04 J		06/14/11	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	2.0 J	1.9 J	1.3 J	0.43 J		06/14/11	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	1.8 J	1.0 J	1.5 J	--- U		06/14/11	LFJ	EPA200.8
Lead, ug/l	0.02	10.0	0.08 J	0.62 J	0.70 J	0.07 J		06/14/11	LFJ	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	0.06 J	0.30	--- U		06/14/11	LFJ	EPA200.8
Nickel, ug/l	0.04	50.0	2.8 J	8.1 J	2.3 J	0.40 J		06/14/11	LFJ	EPA200.8
Selenium, ug/l	0.20	10.0	0.87 J	--- U	1.1 J	--- U		06/14/11	LFJ	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U		06/14/11	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	0.03 J	0.03 J	--- U		06/14/11	LFJ	EPA200.8
Vanadium, ug/l	0.14	25.0	0.34 J	2.5 J	2.1 J	--- U		06/14/11	LFJ	EPA200.8
Zinc, ug/l	0.24	10.0	12	33	9.8 J	3.8 J		06/14/11	LFJ	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	169	251	86			06/07/11	RJH	SM2510B
Temperature, °C			18	18	20			06/07/11	RJH	SM2550B
Static Water Level, feet			29.33	25.39	23.04			06/07/11	RJH	
Well Depth, feet			42.92	35.19	39.83			06/07/11	RJH	

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

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
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CLIENT: HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER, NC 27529

CLIENT ID: 6025

ANALYST: MAO
DATE COLLECTED: 06/07/11
DATE ANALYZED: 06/10/11
DATE REPORTED: 06/24/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	MW-A	MW-B	MW-C	MW-D	MW-E
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	1.00	7.70	--- U	1.60	1.20
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	0.50 J	--- U	--- U	--- U	0.80 J
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	0.30 J	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	0.90 J	1.70 J	--- U	0.50 J	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	0.50 J	8.80	--- U	2.90 J	0.50 J
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	1.50	0.40 J	--- U	0.80 J	2.50
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	4.60	--- U	0.30 J	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	0.50 J	--- U	0.30 J	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	5.00	1.00 J	--- U	1.10 J	17.20
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	1.20	--- U	--- U	0.90 J	3.60
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U

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

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

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

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CLIENT: HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER, NC 27529

CLIENT ID: 6025

ANALYST: MAO
DATE COLLECTED: 06/07/11
DATE ANALYZED: 06/10/11
DATE REPORTED: 06/24/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	MW-F	MW-G	MW-H	MW-I	MW-J
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	9.90	2.20	1.30	12.80	2.10
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	1.20 J	--- U	--- U	0.50 J	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	0.40 J	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	4.40 J	--- U	0.80 J	2.00 J	0.50 J
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	40.60	--- U	9.20	5.90	4.80 J
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	3.10	--- U	0.60 J	3.70	0.50 J
21. 1,2-Dichloroethane	0.27	1.0	0.30 J	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	1.40	--- U	--- U	--- U	0.50 J
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	0.30 J	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	0.50 J	0.40 J	--- U	--- U	0.70 J
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	17.20	--- U	4.30	23.60	0.60 J
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	5.20	--- U	1.10	6.50	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	0.40 J	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U

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

Environment 1, Incorporated

Drinking Water ID: 37715
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GARNER, NC 27529

CLIENT ID: 6025

ANALYST: MAO
DATE COLLECTED: 06/07/11
DATE ANALYZED: 06/10/11
DATE REPORTED: 06/24/11

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	MW-K	MW-L	MW-M	Equipment Blank	Trip Blank
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	1.70	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	0.30 J	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	2.80 J	0.30 J	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	0.30 J	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	1.10	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	1.30 J	0.80 J	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	1.20	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U

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

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

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

CHAIN OF CUSTODY RECORD

CLIENT: 6025 **Week: 24**

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER NC 27529

(919) 772-5393

DISINFECTION
- [ ] CHLORINE
- [ ] UV
- [ ] NONE
- [ ] _____

CHLORINE NEUTRALIZED AT COLLECTION																			
pH CHECK (LAB)		L2				L2	L2	L2											
CONTAINER TYPE, P/G	P	P	P	P		G	G	G											
CHEMICAL PRESERVATION	A	A	A	A		E	E	E											
PARAMETERS	Field pH	Metals	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2											

A - NONE, B - HNO_3, C - H_2SO_4, D - NAOH, E - HCL, F - ZINC ACETATE, G - NA THIOSULFATE

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Metals	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2
MW-A 06	07 11			19	5	G	G	G	G	G	G	G	G
MW-B 06	07 11			18	4	G	G	G	G	G	G	G	
MW-C 06	07 11			17	4	G	G	G	G	G	G	G	
MW-D 06	07 11			18	4	G	G	G	G	G	G	G	
MW-E 06	07 11			21	4	G	G	G	G	G	G	G	
MW-F 06	07 11			21	4	G	G	G	G	G	G	G	
MW-G 06	07 11			18	4	G	G	G	G	G	G	G	
MW-H 06	07 11			18	4	G	G	G	G	G	G	G	
MW-I 06	07 11			18	4	G	G	G	G	G	G	G	
MW-J 06	07 11			17	4	G	G	G	G	G	G	G	
MW-K 06	07 11			18	4	G	G	G	G	G	G	G	

CLASSIFICATION:
- [ ] WASTEWATER (NPDES)
- [ ] DRINKING WATER
- [ ] DWQ/GW
- [x] SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) [signature]

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
[signature] 06	07 11	[signature]	6/7 213
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

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.

№ 217180

FORM #5

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

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

CHAIN OF CUSTODY RECORD

CLIENT: 6025 **Week: 24**

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER NC 27529

(919) 772-5393

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

																					CHLORINE NEUTRALIZED AT COLLECTION
																					pH CHECK (LAB)
						P	P	P	P		G	G	G								CONTAINER TYPE, P/G
						A	A	A	A		E	E	E								CHEMICAL PRESERVATION
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Metals	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2								PARAMETERS
MW-L 06	07 11	1105		18	4	G	G	G	G	G	G	G									
MW-M 06	07 11	0950		20	5	G	G	G	G	G	G	G	G								
Equipment Blank 06	07 11				3		G				G	G									
Trip Blank					2																

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY
Y N

SAMPLES COLLECTED BY: (Please Print)
R Pope / Fox

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Rob N Pope 06	07 11	[illegible]	6/7 1214
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

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.

FORM #5

№ 217179

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#: 6025 A

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER ,NC 27529

DATE COLLECTED: 06/07/11
DATE REPORTED : 06/24/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-1	SW-2	SW-3	SW-4	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.4	6.1	6.3	6.9	06/07/11	RJH	SM4500HB
Antimony, ug/l	0.14	6.0	--- U	--- U	--- U	--- U	06/14/11	LFJ	EPA200.8
Arsenic, ug/l	0.10	10.0	2.5 J	3.1 J	0.62 J	1.9 J	06/14/11	LFJ	EPA200.8
Barium, ug/l	0.02	100.0	79.6 J	75.2 J	1768	415	06/14/11	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	0.09 J	0.07 J	--- U	0.30 J	06/14/11	LFJ	EPA200.8
Cadmium, ug/l	0.02	1.0	0.10 J	0.15 J	0.06 J	0.85 J	06/14/11	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	13	13	363	37	06/14/11	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	1.5 J	1.2 J	0.46 J	4.3 J	06/14/11	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	1.5 J	1.2 J	--- U	4.0 J	06/14/11	LFJ	EPA200.8
Lead, ug/l	0.02	10.0	1.8 J	0.78 J	0.06 J	5.2 J	06/14/11	LFJ	EPA200.8
Nickel, ug/l	0.04	50.0	2.2 J	2.4 J	62	6.3 J	06/14/11	LFJ	EPA200.8
Selenium, ug/l	0.20	10.0	0.30 J	--- U	0.34 J	3.1 J	06/14/11	LFJ	EPA200.8
Silver, ug/l	0.02	10.0	--- U	--- U	--- U	--- U	06/14/11	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U	1.00 J	0.05 J	06/14/11	LFJ	EPA200.8
Vanadium, ug/l	0.14	25.0	5.1 J	3.4 J	0.44 J	5.9 J	06/14/11	LFJ	EPA200.8
Zinc, ug/l	0.24	10.0	11	6.8 J	48	42	06/14/11	LFJ	EPA200.8
Conductivity (at 25c), uMhos	1.0	1.0	88	95	749	730	06/07/11	RJH	SM2510B
Temperature, °C			24	23	18	22	06/07/11	RJH	SM2550B

J = Between MDL and SWSL, U = Below ALL Quanititation 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: HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER, NC 27529

CLIENT ID: 6025 A

ANALYST: MAO
DATE COLLECTED: 06/07/11
DATE ANALYZED: 06/10/11
DATE REPORTED: 06/24/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	SW-1	SW-2	SW-3	SW-4
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	4.10	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	0.90 J	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	1.50 J	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	11.30	--- U
15. 2-Butanone	2.21	100.0	2.40 J	2.60 J	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U	1.00	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U	9.00	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U	2.30	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U

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

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

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

CHAIN OF CUSTODY RECORD

CLIENT: 6025 A **Week: 24**

HERTFORD COUNTY LANDFILL
C/O MUNICIPAL ENGINEERS
P.O. BOX 97
GARNER NC 27529

(919) 772-5393

DISINFECTION
- ☐ CHLORINE
- ☐ UV
- ☐ NONE
- ☐ _____

																							CHLORINE NEUTRALIZED AT COLLECTION
																							pH CHECK (LAB)
																							CONTAINER TYPE, P/G
																							CHEMICAL PRESERVATION
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Metals	Conductivity	Temperature	EPA 8260B	8260 Dup. 1												PARAMETERS
						P	P	P	P	G	G												
						A	A	A	A	E	E												
SW-1 06	07 11	1150		24	4	G	G	G	G	G	G												
SW-2 06	07 11	1140		23	4	G	G	G	G	G	G												
SW-3 06	07 11	1025		18	4	G	G	G	G	G	G												
SW-4 06	07 11	1045		22	4	G	G	G	G	G	G												

CHEMICAL PRESERVATION:
- A - NONE
- B - HNO_3
- C - H_2SO_4
- D - NAOH
- E - HCL
- F - ZINC ACETATE
- G - NA THIOSULFATE

CLASSIFICATION:
- ☐ WASTEWATER (NPDES)
- ☐ DRINKING WATER
- ☐ DWQ/GW
- ☒ SOLID WASTE SECTION

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) [signature]

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
[signature]	06 07 11	[signature]	6/7/13
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

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.

№ 217178

FORM #5