Semi-Annual Water Quality Monitoring and Statistical Analysis Report

Prepared for

Lenoir County Active C&D and Closed MSWLF
LaGrange, North Carolina

January 2011

Permit Number: 54-03
MESCO Project Number: G10015.0

Submittal Date: April 18, 2011

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)
Lenoir County Active C&D Landfill and Closed Unlined MSWLF	2949 Hodges Farm Road LaGrange, NC 28501	54-03	.1600	January 27, 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) MNA Analysis For 7 Wells per CAP
☐ 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, PG | Professional Geologist | (919) 772-5393

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

Signature | Date: 4/18/2011

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 2275 4/18/2011 GEOLOGIST MADELINE GERMAN

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

TABLE OF CONTENTS

SECTION	PAGE
Introduction	1
Sampling Procedures	2
Field Parameter Data	2
Laboratory Results	2
Quality Control Samples	2
Groundwater Samples	2
Surfacewater Samples	2
Statistical Analysis	2
Groundwater Characterization	3
Findings	3
Closing	3

PLATES

Plate 1 ..... Topographic Map with Site Location

Plate 2 ..... Single-Day Potentiometric Map of Uppermost Aquifer

TABLES

Table 1 ..... Sampling and Analysis Summary

Table 2 ..... Detections Above SWSL, GWP, 2L, or 2B (Appendix I)

Table 3 ..... Detections Above MDL (Appendix II Exclusive)

Table 4 ..... Hydrologic Properties at Monitoring Well Locations

APPENDICIES

Appendix A ..... Statistical Analysis

Appendix B ..... Laboratory Analysis Report & Chains of Custody

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

April 18, 2011

Ms. Jaclynne Drummond
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Semi-Annual Water Quality Monitoring and Statistical Analysis Report
Lenoir County Active C&D and Closed MSWLF
Permit No. 54-03
MESCO Project No. G10015.0

Dear Ms. Drummond:

Introduction

The Lenoir County Active Construction and Demolition (C&D) Landfill and Closed Unlined Sanitary municipal solid waste landfill (MSWLF) is located on Hodges Farm Road (SR 1524), La Grange, Lenoir County, North Carolina and operates under permit #54-03. Prior to operation as a C&D landfill the site operated as a MSW unlined sanitary landfill. A small area of the MSW, located in the southern portion of the facility stopped receiving waste prior to October 1994 and was closed with a 24 inch soil cover. The remainder was closed prior to October 1998, with an 18-inch cohesive soil cap having a permeability of 1 x 10-5 cm/sec, and 18 inches of erosive layer, as part of the *Lenoir County Transition Plan.* The C&D landfill was constructed and is operating on top of the capped MSW unit. On the same contiguous property and utilizing the same scale house is the existing Subtitle D MSW landfill, which is monitored separately, under permit #54-09. A topographic map showing the facility location is included as **Plate 1**.

The closed MSW and active C&D landfill are contiguous. therefore monitored together for continuity in reporting. The landfill is required to submit semi-annual compliance reports as a condition of the water quality monitoring program. Environment 1 (E1) of Greenville, NC reportedly performed this sampling event on January 27, 2011 in accordance with the semi-annual monitoring schedule prescribed by the NC Solid Waste Section (SWS) rules/regulations as promulgated in 15A NCAC 13B.1600.

As specified in 15A NCAC 13B.1632(j) and the SWS Environmental Monitoring Report Form, this report contains sampling procedures, field and laboratory results, groundwater and surface water characterization, and findings. Detections compared to their respective standards tables, hydrogeologic properties table, a monitoring network field observations table, field parameter data results, potentiometric map, statistical analysis, quality assurance/quality control data, and laboratory analytical data results with chain-of-custody (C-O-C) are included. The currently approved corrective action for this facility is monitored natural attenuation (MNA). The MNA analysis performed during this event is discussed in a separately submitted *Corrective Action Evaluation Report* (CAER).

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

Sampling Procedure

E1 reportedly performed this sampling event utilizing portable monitoring methodology in accordance with the approved Sampling & Analysis Plan (SAP) contained in the *Corrective Action Plan* (CAP) submitted April 30, 2009. E1 reportedly collected water samples from six downgradient groundwater monitoring wells (MW-3, MW-4, MW-6, MW-9, MW-11 and MW-12), the background well (MW-1), and both surface water points (SW-1 and SW-3). Quality control measures were implemented including submittal and subsequent quantification of a travel blank (TB) and equipment blank (EB). Monitoring locations are shown on the single-day potentiometric map (**Plate 2)**.

Static water levels in each well were measured electronically prior to purging. Additional static water level readings were recorded from two supplementary monitoring wells (MW-8 and MW-10) to improve potentiometric map coverage. Collected samples were transported under proper C-O-C protocol and analyzed within the specified hold times for each method. In addition to the required field parameters (pH, specific conductance, and temperature) the field MNA parameters (turbidity, ORP, and DO) were also reported by E1.

Field Parameter Data

Field parameter data, as recorded by E1, is presented in the laboratory analysis results report (**Appendix B**).

Laboratory Results

E1 reportedly analyzed the water samples for the Appendix I list of constituents, total mercury, plus the Appendix II exclusive constituent (defined in this report as constituents not also included in Appendix I) detected during the previous July 2010 event. Additionally, the designated corrective action monitoring wells were analyzed for the MNA parameters list as provided by the SWS. Microseeps Inc. of Pittburgh, PA performed the analysis of three MNA parameters (volatile fatty acids, methane/ethene/ethane, and dissolved hydrogen). A sampling and analysis summary is presented on **Table 1**.

Water samples were analyzed to the laboratory-established Method Detection Limits (MDL), which are at or below the current Solid Waste Section Limit (SWSL). **Table 2** summarizes constituents detected in groundwater and surface water samples above the current SWSL, Groundwater Protection Standards (GWP), North Carolina Groundwater Standards (2L) or the applicable Class C North Carolina Surface Water Standards (2B). **Table 3** summarizes Appendix II exclusive detections above the MDL. Laboratory results and C-O-Cs are presented in **Appendix B**.

Quality Control Samples

Eight of the seventeen (47%) total metals, including the Appendix II constituent tin, were detected in low non-quantifiable ("j" qualified) concentrations in the EB. Two VOCs were detected in low non-quantifiable ("j" qualified) concentrations in FB. The detection of tin in the EB indicates that artifact contamination may have attributed to false positives or high bias concentrations of tin as detected in the groundwater samples.

Groundwater Samples

Total metals were not detected in quantifiable concentrations above their respective 2L or GWP Standard. Samples from MW-12 contained benzene and a non-quantifiable concentration of vinyl chloride above their respective 2L Standard. Appendix II exclusive parameter, tin, was detected in a non-quantifiable concentration in MW-3 and background well MW-1.

Surfacewater Samples

A sample collected from SW-1, located downstream from the facility, contained a zinc concentration above the applicable 2B Standard. Upstream sample SW-3, also contained zinc but in a concentration below the SWSL and 2B Standard.

Statistical Analysis

Statistical analysis was performed on constituents detected in quantifiable concentrations (above SWSL) from the monitoring wells samples. The statistical comparison between baseline and current groundwater analytical data is consistent with US EPA guidance documents and meets or exceeds the performance criteria specified in 15A NCAC 13B.1362. Statistical analysis methodologies overview, summary tables, graphs, and worksheets are presented in **Appendix A**.

Total metals sampling results from this event were consistent with historical results. Based on interwell analysis detected metals did not exhibit a SSI in concentrations over background levels established by MW-1.

Benzene in MW-12 and toluene in MW-4 were the only VOCs detected in quantifiable concentrations during this event. VOCs detected during this event have previously been found at their respective location and concentrations were within their historically identified range. A qualitative evaluation of VOC concentrations over time indicate that neither of the detected VOCs have exhibited an increasing trend.

Groundwater Characterization

A single-day potentiometric map for the uppermost aquifer from groundwater elevation data collected during this event is included as **Plate 2**. Groundwater flow rates and directions were calculated based on collected data and are included in **Table 3**. Flow direction trends in a general northeasterly direction towards Falling Creek. Groundwater flow rates ranged from approximately 1 foot/year (MW-3) to 41 feet/year (MW-11) averaging approximately 18 feet/year. The flow directions and gradients are generally consistent with historical observations.

Findings

The reported total metal detections in the groundwater samples are not attributed to leachate but likely naturally inherent in the groundwater geochemistry. The quantifiable metal concentrations were below the GWP or 2L Standard and did not exhibit a SSI.

MW-12, located within the compliance boundary, contained a concentration of benzene slightly above the 2L Standard; however, an increasing trend over time is not evident.

Although zinc was detected in a concentration in exceedance of the 2B standard in SW-1 the source was not attributed to landfill activities. Zinc concentrations in SW-1 have historically been sporadic and zinc was also detected in upstream SW-3, upgradient background well MW-1, and the EB.

The detections of the Appendix II exclusive constituent tin is also likely not an indication of a leachate release since non-quantifiable concentrations were found in samples from MW-3 as well as background MW-1 and the EB.

Closing

Semi-annual water quality monitoring will continue at the facility and the next water sample collection event is tentatively scheduled for July 2011. Please contact us either by phone at (919) 772-5393, or by email at jpfohl@mesco.com or mgerman@mesco.com should you have any questions or concerns regarding this report.

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

Jonathan Pfohl
Environmental Specialist

Mardeline German, PG
Professional Geologist

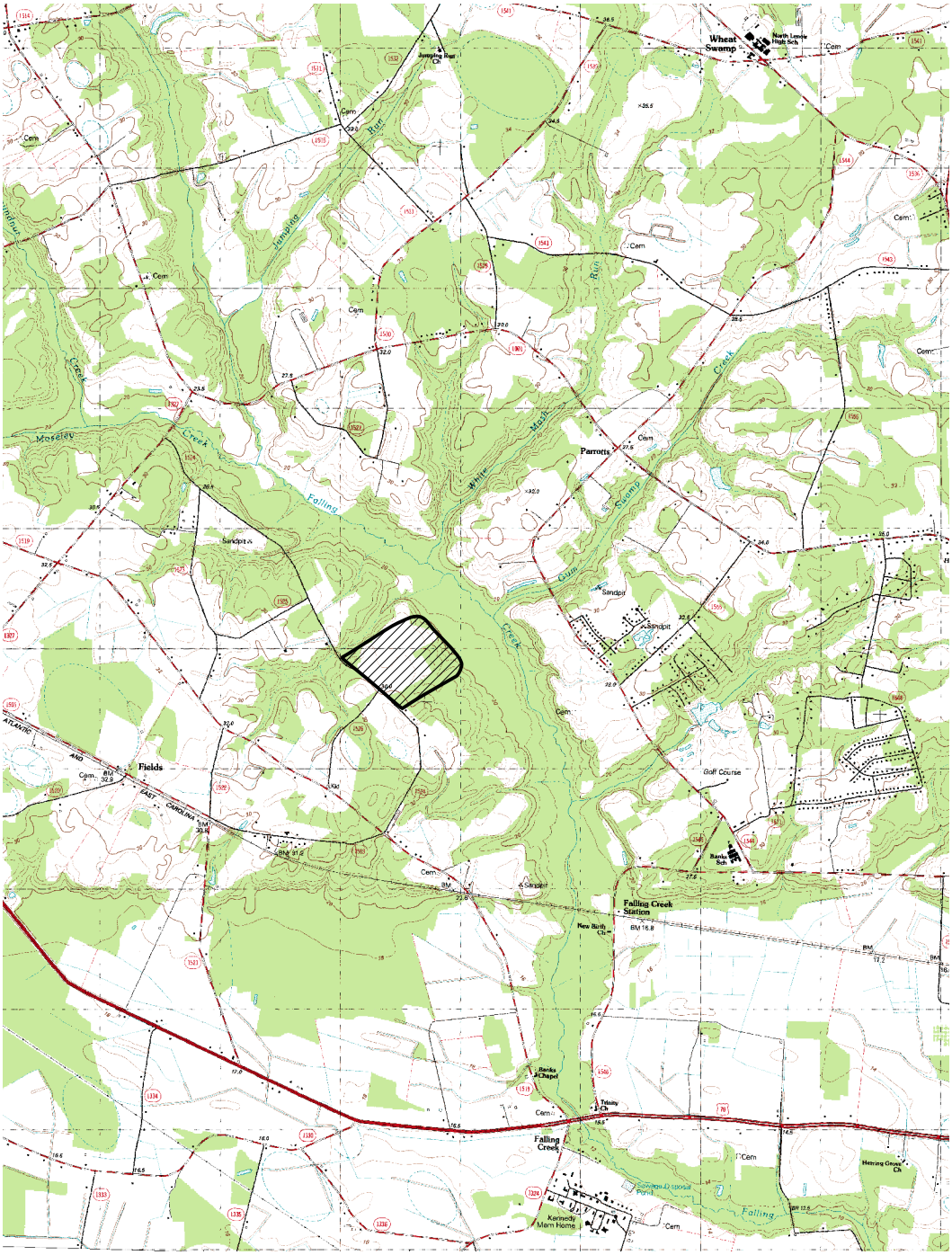
Enclosures
cc: Mr. Tom Miller
Lenoir County

Plates

Topographic Map with Site Location

Semi-Annual Water Quality Monitoring

PLATE 1 Lenoir County MSWLF Facility



QUADRANGLE LEGEND N

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

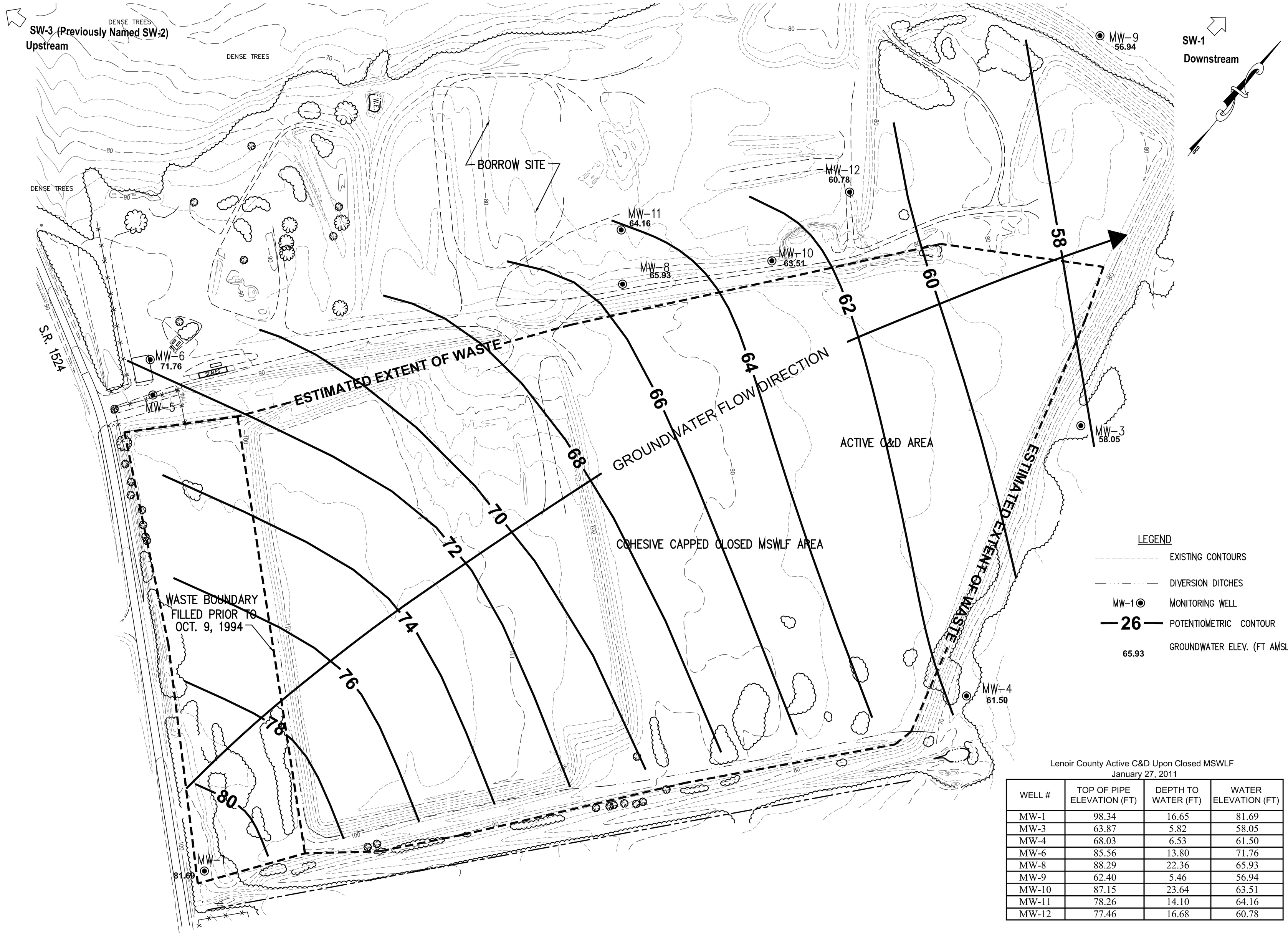
Unimproved road

Interstate Route U. S. Route State Route

Municipal Services Engineering Company

Garner, NC Boone, NC

Municipal Engineering Services Company, PA



Lenoir County Active C&D Upon Closed MSWLF
January 27, 2011

WELL #	TOP OF PIPE ELEVATION (FT)	DEPTH TO WATER (FT)	WATER ELEVATION (FT)
MW-1	98.34	16.65	81.69
MW-3	63.87	5.82	58.05
MW-4	68.03	6.53	61.50
MW-6	85.56	13.80	71.76
MW-8	88.29	22.36	65.93
MW-9	62.40	5.46	56.94
MW-10	87.15	23.64	63.51
MW-11	78.26	14.10	64.16
MW-12	77.46	16.68	60.78

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

ACTIVE C&D LANDFILL OVER
CLOSED MSWLF
LENOIR COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

SINGLE DAY POTENTIOMETRIC MAP
UPPERMOST AQUIFER JANUARY 27, 2011

SCALE: 1"=100'
DATE: 3/08/11
DRWN. BY: R. MOSS
CHKD. BY: M. GERMAN
PROJECT NUMBER G10015.0
DRAWING NO. PLATE 2
SHEET NO. 1 OF 1

Tables

Table 1
Sampling and Analysis Summary
January 27, 2011

		App. I		App. II		MNA													Field Parameter					
	Reason Not Sampled	VOCs	Total Metals	Mercury	Tin	VFA	Hydrogen	Methane/Ethene/Ethane	Dissolved CO2	Alkalinity	Sulfate	Sulfide	Chloride	TOC	COD	BOD	Iron	Nitrate	Dissolved Oxygen (DO)	Oxidation Reduction Potential (ORP)	Temperature	Conductivity	pH	Turbidity
		Lab EPA 8260B	Lab EPA200.8	Lab EPA 200.8	Lab EPA 6010C	Lab AM23G	Lab AM20GAX	Lab AM20GAX	Lab SM4500CO2C	Lab SM2320B	Lab SM426B	Lab SM18 4500-S2D	Lab SM4500-CLB	Lab SM 5310C	Lab HACH8000	Lab SM5210B	Lab SM3111B	Lab EPA353.2	Field Meter	Field Meter	Field Meter	Field Meter	Field Meter	Field Meter
MW-1		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-3		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-4		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-6		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-9		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-11		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-12		x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SW-1		x	x	x															x	x	x	x	x	x
SW-3		x	x	x															x	x	x	x	x	x
EB		x	x	x	x																			
TB		x																						

App I & II = Appendix Lists from current 40 CFR 258

Table 2
Detections above SWSL, GWP, 2L, or 2B (Appendix I)
January 27, 2011

Well ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause
MW-3	Vanadium	1/27/11	13.4 j	ug/l	0.03	25			3.5	9.9	
MW-3	Zinc	1/27/11	74	ug/l	0.08	10	1050				
MW-4	Vanadium	1/27/11	13.8 j	ug/l	0.03	25			3.5	10.3	
MW-4	Zinc	1/27/11	31	ug/l	0.08	10	1050				
MW-4	Toluene	1/27/11	3	ug/l	0.23	1	600				
MW-9	Cobalt	1/27/11	11	ug/l	0.1	10			70		
MW-12	Barium	1/27/11	204	ug/l	0.03	100	700				
MW-12	**Vinyl Chloride**	**1/27/11**	**0.7 j**	**ug/l**	**0.63**	**1**	**0.03**			**0.67**	**L &/or LFG**
MW-12	**Benzene**	**1/27/11**	**1.5**	**ug/l**	**0.24**	**1**	**1**			**0.5**	**L &/or LFG**
SW-1	**Zinc**	**1/27/11**	**64**	**ug/l**	**0.08**	**10**		**50**		**14**	**N**

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

[2] MDL = Method Detection Limit

[3] SWSL = Solid Waste Section Reporting Limit (Current as of Sampling Event)

[4] 2L = North Carolina 15A NCAC 2L Groundwater Qualtity Standard (Current as of Sampling Event)

[5] 2B = North Carolina 15 NCAC 2B Surface Water Quality Standard for this Specific Stream Classification (Current as of Sampling Event)

[6] GWP = Groundwater Protection Standard (Current as of Sampling Event)

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.

L = Leachate

LFG = Landfill Gas

N = Natural. Erosion of natural deposits

BOLD = Concentration > 2L, or 2B Standard (Current as of Sampling Event)

Table 3
Detections Above MDL (Appendix II Exclusive Detections)
January 27, 2011

Well ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause
MW-1	Tin	1/27/11	0.2 j	ug/l	0.11	100	NE	NE	NE		
MW-3	Tin	1/27/11	0.8 j	ug/l	0.11	100	NE	NE	NE		
EB	Tin	1/27/11	0.4 j	ug/l	0.11	100	NE	NE	NE		

[1] Table contains only Appendix II exclusive (not also included in Appendix I) constituents detected above MDL
[2] MDL = Method Detection Limit
[3] SWSL = Solid Waste Section Reporting Limit (Current as of Sampling Event)
[4] 2L = North Carolina 15A NCAC 2L Groundwater Qualtity Standard (Current as of Sampling Event)
[5] 2B = North Carolina 15 NCAC 2B Surface Water Quality Standard for this Specific Stream Classification (Current as of Sampling Event)
[6] GWP = Groundwater Protection Standard (Current as of Sampling Event)
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.
NE = Not Established (Currently)
BOLD = Concentration > 2L, or 2B Standard (Current as of Sampling Event)

Table 4
Hydrologic Properties at Monitoring Well Locations
January 27, 2011

Monitoring Well	Hydraulic Conductivity (cm/sec)	Effective Porosity (%)	Hydraulic Gradient	Groundwater Velocity Rate (ft/yr)	Flow Direction	Water Table Depth (ft)	Water Table Elevation (ft)	Screened Interval Lithology
MW-1	4.30E-04	20%	0.011	24	N27E	16.65	81.69	Silty Sand
MW-3	1.30E-04	20%	0.002	1	N42E	5.82	58.05	Silty Sand
MW-4	5.40E-04	20%	0.011	30	N30E	6.53	61.50	Silty Sand
MW-6	-	-	0.010	-	N14W	13.80	71.76	Silty Sand
MW-9	3.80E-04	20%	0.006	12	N42E	5.46	56.94	Sandy Clay
MW-11	6.59E-04	20%	0.012	41	N18W	14.10	64.16	Sand
MW-12	2.10E-04	20%	0.006	6	N40E	16.68	60.78	Sand

NOTE: 1.Hydraulic conductivity (K) values for MW-1 through MW-10 were obtained from GAI Consultants (June 1996).
K values for MW-11 and MW-12 were based on slug test results conducted by MESCO in July 1999.
2.Water levels were measured prior to sampling by Environment 1, Inc. on January 27, 2011.

Linear velocidty rate (Q) is defined by the equation:

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

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

Minimum v_x:	1
Mean v_x:	19
Median v_x:	18
Maximum v_x:	41

Appendix A
Statistical Analysis

Statistical Analysis Methodology

Statistical Analysis Methodologies

A statistical analysis was performed on metal and VOC detections utilizing Chemstat software, which was developed specifically for RCRA Subtitle D sites and conforms to both current EPA and SWS protocols. A step-wise approach was utilized to evaluate trends in groundwater quality to identify a potential release from the landfill. Analytical data underwent preliminary data evaluation to reduce the data set and to determine if any "outliers" (defined as data that appears to be incongruent with respect to historical results) or seasonality exists that may potentially effect the results of the subsequent statistical analysis. All statistical tests were evaluated at the 0.05 level of significance, 95% confidence level, and were conducted as one-tailed tests. Statistical background values were calculated using un-manipulated data from historical semi-annual sampling events for this facility from 1994 to the current event. Historical data compiled for monitoring well(s) were used as the baseline. Groundwater data from the downgradient well(s) were compared to the pooled background groundwater data (inter-well) using methods which varied depending upon the percentage of non-detects. If necessary and applicable further intra-well analysis was conducted to compare current data from a single well to it's own respective historical data. Finally, parameters that indicated statistical significance after previous tests were evaluated to estimate the change in concentration over time to determine the presence of an upward trend.

Preliminary Data Evaluation

A preliminary data screening was conducted on detections. Parameters detected with concentrations found below quantifiable levels (SWSL) and below those detected in the background well were eliminated and a statistical analysis was not conducted for that particular constituent/well.

Data distributions were reviewed using box and whiskers plots (enclosed charts). In order to evaluate variability in concentrations with respect to time and season, time series plots were generated for select constituents (enclosed charts). Time series plots were also visually evaluated for seasonality and "outliers". Suspected outliers were than further evaluated through the applicable Dixon's, Rosner's, &/or Discordance Test for Outliers depending upon the number of samples and the data distribution. Outliers are generally not censored from the current nor historical data set prior to statistical analysis but are further evaluated and or qualified as necessary.

Inter-well Analyses

Inter-well statistical analysis was conducted upon total metals detected during this sampling event. Monitoring well MW-1 was defined as the background well. An upper tolerance limit (UTL) with 95% coverage was computed for each detected constituent from the background data at a 95% level of confidence. For each tested constituent, an appropriate statistical analysis method was selected based on the percentages of non-detects (%ND) in the historical background data. The following **Table 1** summarizes the methods used for four different %ND ranges.

Table 1. Statistical Analysis Methods for Various %ND Ranges

%ND	Analysis Method	ND Substitution
%ND<15%	Parametric tolerance limit	1/2 ND
15%<%ND<50%	Parametric tolerance limit	Cohen or 1/2 ND
50%<%ND<90%	Non-parametric tolerance limit	1/2 ND
90%<%ND	Poisson tolerance limit	-

NOTE: For parametric tolerance interval, normality of the background data was checked by the Shapiro-Wilks normality test, as the method requires that the data be normally distributed.

Intra-well Analysis

Intra-well analysis was conducted only on those constituents found to be statistically significant by inter-well analysis with sufficient historical samples known to not be impacted. With intra-well comparisons, data from a single well is compared to historical data from the same well. In general, intra-well analysis is typically used to differentiate true contamination from spatial variability. Intra-well analysis is generally conducted through interpretation of Shewhart-CUSUM and/or Exponentially Weighted Moving Average (EWMA) control charts. where applicable.

Poisson Prediction Interval (VOCs)

Historical VOC detections in the background well MW-1 were pooled to determine the total number of detections, from which the expected number of detections in a single downgradient monitoring point (y^*) was derived by utilizing the Poisson prediction interval. The parameter y^* is defined by the following equation:

$$y^* = cy + \frac{t^2 c}{2} + tc\sqrt{y\left(1+\frac{1}{c}\right)+\frac{t^2}{4}}$$

where

c = 1/ n (n =number of background samples)
t = one-sided value of student's t -Statistic at 95% confidence [a]
y = number of events observed in n previous samples
y^* = expected number of events in a single future sample

[a] Gibbons, R.D., 1994, Statistical methods for groundwater monitoring: John Wiley & Sons, Inc., p.12.

For each monitoring location showing any VOC detections, the number of detected VOCs was counted with each detection being considered a "hit". The number was then compared with the expected number of detections derived from the background VOC data. The value of Student's t -Statistic was derived from tabulated values included in Gibbons (1994).

Determine Data Trend Over Time

The parameters that indicated statistical significance a further qualitative evaluation is employed to determine trends in concentration over time. Implementation of Mann-Kendall Trend Analysis or Sen's Slope Analysis is generally used to determine if the concentration trend is increasing, decreasing, or remaining constant.

Statistical Analysis Summary
Tables & Graphs

Inter-Well Analysis Summary
January 27, 2011

Background Well: MW-1

Barium, total

%ND	Normality	Method	ND Adj.	Upper Limit (a = 95%)	Unit
100	-	Poisson tolerance limit	ND	11.0	log[ug/l]

Well	Result	Significance
MW-12	5.743	no

NOTE: Bold-faced monitoring points indicate detected levels exceed North Carolina Groundwater 2L Standard.

Summary of Pooled VOCs in Background Well (MW-1)
January 27, 2011

Constituent	Samples	NDs	% NDs
1,1,1,2-Tetrachloroethane	35	35	100.00
1,1,1-Trichloroethane	35	35	100.00
1,1,2,2-Tetrachloroethane	35	35	100.00
1,1,2-Trichloroethane	35	35	100.00
1,1-Dichloroethane	35	35	100.00
1,1-Dichloroethene	35	35	100.00
1,2,3-Trichloropropane	35	35	100.00
1,2-Dibromo-3-chloropropane	35	35	100.00
1,2-Dibromoethane	35	35	100.00
1,2-Dichlorobenzene	35	35	100.00
1,2-Dichloroethane	35	35	100.00
1,2-Dichloropropane	35	35	100.00
1,4-Dichlorobenzene	35	35	100.00
2-Butanone	35	35	100.00
2-Hexanone	35	35	100.00
4-Methyl-2-Pentanone	35	35	100.00
Acetone	35	35	100.00
Acrylonitrile	35	35	100.00
Benzene	35	35	100.00
Bromochloromethane	35	35	100.00
Bromodichloromethane	35	35	100.00
Bromoform	35	35	100.00
Bromomethane	35	35	100.00
Carbon disulfide	35	35	100.00
Carbon tetrachloride	35	35	100.00
Chlorobenzene	35	35	100.00
Chloroethane	35	35	100.00
Chloroform	35	35	100.00
Chloromethane	35	35	100.00
cis-1,2-Dichloroethene	35	35	100.00
cis-1,3-Dichloropropene	35	35	100.00
Chlorodibromomethane	35	35	100.00
Dibromomethane	35	35	100.00
Ethylbenzene	35	35	100.00
Iodomethane	35	35	100.00
Dichloromethane	35	35	100.00
Styrene	35	35	100.00
Tetrachloroethylene	35	35	100.00
Toluene	35	35	100.00
trans-1,2-Dichloroethene	35	35	100.00
trans-1,3-Dichloropropene	35	35	100.00
trans-1,4-Dichloro-2-butene	35	35	100.00
Trichloroethylene	35	35	100.00
Trichlorofluoromethane	35	35	100.00
Vinyl acetate	35	35	100.00
Vinyl chloride	35	35	100.00
Xylene	35	35	100.00
Total	**1645**	**1645**	**100.00**

Poisson Prediction Interval Based upon Pooled Background VOCs
January 27, 2011

Detected VOCs (Background Well: MW-1)

Well	Benzene	Toluene	Total Cumulative Concentration	Total Detections >SWSL
2L	**1**	**600**	**-**	**-**
MW-4		3	3	1
MW-12	**1.5**		1.5	1
TOTAL	1.5	3	4.5	2

All Concentrations in ug/L

"j" qualifiers omitted for statistical analysis purposes

Bold = Detected above 2L Standard (Current as of Sampling Event)

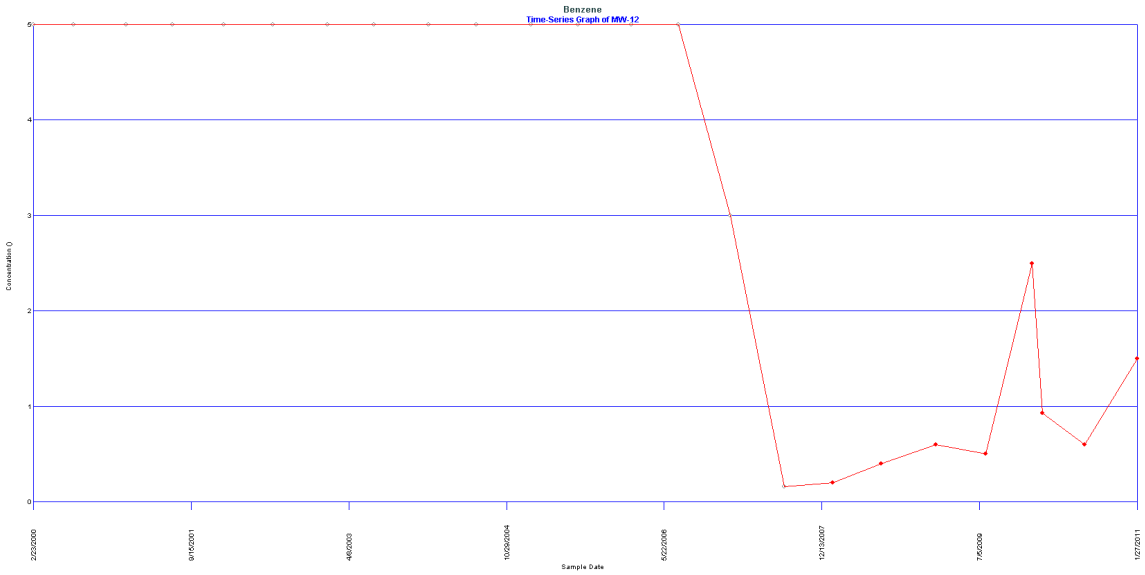
↑ = Increasing concentration trend per Sen's Slope Indicator Analysis.

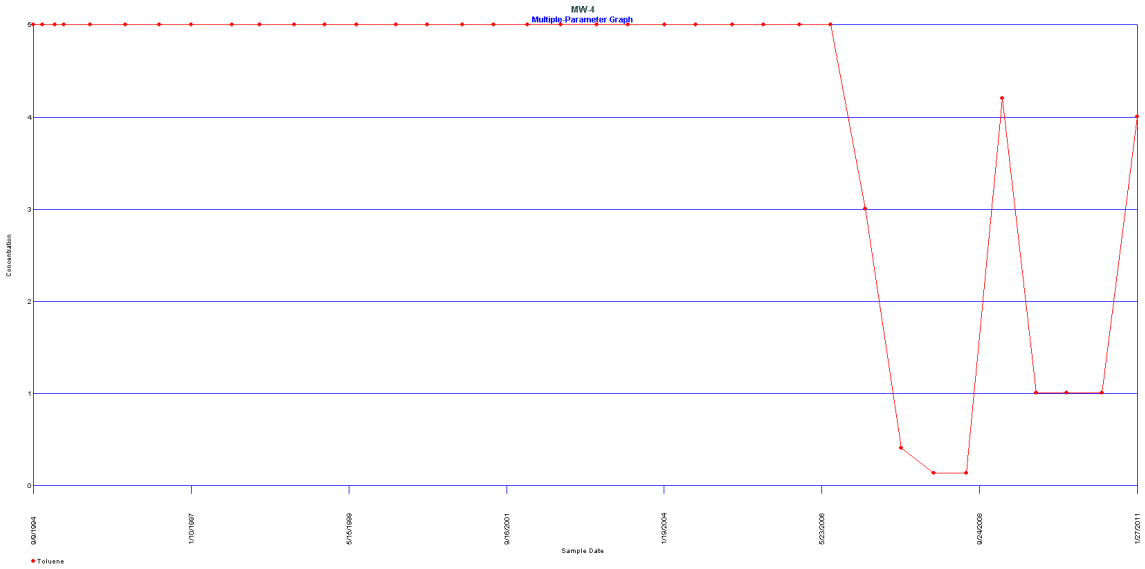
Underlined = Concentration detected outside own historically identified range

Total number of sampling events [n] = 35
Total number of detections in background wells [y] = 0
Number of comparisons (downgradient wells) [k] = 6
One-sided value of Student's t-statistic (95% confidence) [t] = 2.5
Expected number of detections in a single future sample [y*] = 0.03

Statistically Significant # of VOC Detections in MW-4 & MW-12
No VOC Concentrations Exhibited an Increasing Trend

Time Series Plots for Select Constituents (VOCs)
January 27, 2011





Non-Detects Represented at Detection Limit

Statistical Analysis
Basic Statistics

Basic Statistics

Parameter: Barium, total

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

Total Measurements	94
Total Non-Detects	88 (93.617%)
Pooled Mean	207.479
Pooled Std Dev	81.2504
Compliance Meas.	58
Compliance Mean	212.121
Compliance Std Dev	77.311
Background Meas.	36
Background Mean	200
Background Std Dev	87.831

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total
MW-1	36	36	100	7200

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	200	87.831	0	1602	44.5

Compliance Locations

There are 2 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-3	34	34	100	7100
MW-12	24	18	75	5203

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-3	208.824	82.0851	8.82353	19.5763	1513	44.5
MW-12	216.792	71.4575	16.7917	21.572	1350	56.25

Analysis of Variance Statistics

SS Wells	4156.56
SS Total	613951

Kruskal-Wallis Statistics

Non-Detect Rank	44.5
Background Rank Sum	1602
Background Rank Mean	44.5
H Statistic	3.31579
H Adjusted for Ties	18.4683

Basic Statistics

Parameter: Cobalt, total

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

Total Measurements	134
Total Non-Detects	113 (84.3284%)
Pooled Mean	8.0597
Pooled Std Dev	9.64307
Compliance Meas.	98
Compliance Mean	9.18367
Compliance Std Dev	11.0792
Background Meas.	36
Background Mean	5
Background Std Dev	0

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total
MW-1	36	36	100	180

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	5	0	0	2052	57

Compliance Locations

There are 3 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-3	31	31	100	155
MW-4	31	29	93.5484	166
MW-9	36	17	47.2222	579

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-3	5	0	0	2.06077	1767	57
MW-4	5.35484	1.37957	0.354839	2.06077	1882	60.7097
MW-9	16.0833	16.1588	11.0833	1.98238	3344	92.8889

Analysis of Variance Statistics

SS Wells	3171.68
SS Total	12367.5

Kruskal-Wallis Statistics

Non-Detect Rank	57
Background Rank Sum	2052
Background Rank Mean	57
H Statistic	21.2415
H Adjusted for Ties	53.0597

Basic Statistics

Parameter: Zinc, total

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

Total Measurements	139
Total Non-Detects	98 (70.5036%)
Pooled Mean	73.3073
Pooled Std Dev	167.809
Compliance Meas.	103
Compliance Mean	90.6675
Compliance Std Dev	191.71
Background Meas.	36
Background Mean	23.6378
Background Std Dev	22.3172

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total
MW-1	36	34	94.4444	850.96

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	23.6378	22.3172	0	1908	53

Compliance Locations

There are 3 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-3	36	12	33.3333	6248
MW-4	36	26	72.2222	2192.79
MW-9	31	26	83.871	897.96

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-3	173.556	248.228	149.918	37.2345	3525	97.9167
MW-4	60.9108	183.865	37.2731	37.2345	2434	67.6111
MW-9	28.9665	19.7662	5.32867	38.7068	1863	60.0968

Analysis of Variance Statistics

SS Wells	517086
SS Total	3.88606e+006

Kruskal-Wallis Statistics

Non-Detect Rank	49.5
Background Rank Sum	1908
Background Rank Mean	53
H Statistic	25.718
H Adjusted for Ties	39.5928

Statistical Analysis
Inter-well Analysis

Poisson Tolerance Limit

Parameter: Barium, total

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

Poisson Count of 36 background measurements = 209.241
Degrees of Freedom = 420

95% Confidence Values

Chi-Squared Value (95% Confidence) = 468.782
Lambda (from Zack's formula) = 6.51086
Smallest Degrees of Freedom = 23
Upper Tolerance Limit (95%) = 10.5

99% Confidence Values

Chi-Squared Value (99% Confidence) = 490.35
Lambda (from Zack's formula) = 6.81042
Smallest Degrees of Freedom = 29
Upper Tolerance Limit (99%) = 13.5

	Date	Conc.	Significant 95%	Significant 99%
MW-12	2/23/2000	ND<6.21461	FALSE	FALSE
	2/23/2000	ND<6.21461	FALSE	FALSE
	7/17/2000	ND<6.21461	FALSE	FALSE
	1/24/2001	ND<6.21461	FALSE	FALSE
	7/11/2001	ND<6.21461	FALSE	FALSE
	1/10/2002	ND<6.21461	FALSE	FALSE
	7/8/2002	ND<6.21461	FALSE	FALSE
	1/22/2003	ND<6.21461	FALSE	FALSE
	7/7/2003	ND<6.21461	FALSE	FALSE
	1/22/2004	ND<6.21461	FALSE	FALSE
	7/12/2004	ND<6.21461	FALSE	FALSE
	1/26/2005	ND<6.21461	FALSE	FALSE
	7/14/2005	ND<6.21461	FALSE	FALSE
	1/25/2006	ND<6.21461	FALSE	FALSE
	7/13/2006	ND<6.21461	FALSE	FALSE
	1/17/2007	ND<4.60517	FALSE	FALSE
	7/31/2007	ND<4.60517	FALSE	FALSE
	1/23/2008	ND<4.60517	FALSE	FALSE
	7/15/2008	5.20401	FALSE	FALSE
	1/28/2009	4.94164	FALSE	FALSE
	7/29/2009	5.52146	FALSE	FALSE
	1/12/2010	5.37064	FALSE	FALSE
	7/21/2010	5.743	FALSE	FALSE
	1/27/2011	5.31812	FALSE	FALSE

Poisson Tolerance Limit

Parameter: Cobalt, total

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

Poisson Count of 36 background measurements = 82.8931
Degrees of Freedom = 167

95% Confidence Values

Chi-Squared Value (95% Confidence) = 198.154
Lambda (from Zack's formula) = 2.75214
Smallest Degrees of Freedom = 13
Upper Tolerance Limit (95%) = 5.5

99% Confidence Values

Chi-Squared Value (99% Confidence) = 212.431
Lambda (from Zack's formula) = 2.95043
Smallest Degrees of Freedom = 17
Upper Tolerance Limit (99%) = 7.5

	Date	Conc.	Significant 95%	Significant 99%
MW-9	9/9/1994	2.94444	FALSE	FALSE
	10/28/1994	ND<2.30259	FALSE	FALSE
	1/6/1995	ND<2.30259	FALSE	FALSE
	2/24/1995	ND<2.30259	FALSE	FALSE
	7/17/1995	2.83321	FALSE	FALSE
	1/23/1996	ND<2.30259	FALSE	FALSE
	7/25/1996	2.48491	FALSE	FALSE
	1/14/1997	2.48491	FALSE	FALSE
	7/17/1997	ND<2.30259	FALSE	FALSE
	1/21/1998	ND<2.30259	FALSE	FALSE
	7/27/1998	ND<2.30259	FALSE	FALSE
	1/6/1999	ND<2.30259	FALSE	FALSE
	6/29/1999	ND<2.30259	FALSE	FALSE
	1/27/2000	2.83321	FALSE	FALSE
	7/17/2000	2.56495	FALSE	FALSE
	1/24/2001	3.7612	FALSE	FALSE
	7/11/2001	ND<2.30259	FALSE	FALSE
	1/10/2002	ND<2.30259	FALSE	FALSE
	7/8/2002	3.89182	FALSE	FALSE
	1/22/2003	3.7612	FALSE	FALSE
	7/7/2003	4.04305	FALSE	FALSE
	1/22/2004	4.17439	FALSE	FALSE
	7/12/2004	ND<2.30259	FALSE	FALSE
	1/26/2005	3.49651	FALSE	FALSE
	7/14/2005	2.70805	FALSE	FALSE
	1/25/2006	2.77259	FALSE	FALSE
	7/13/2006	ND<2.30259	FALSE	FALSE
	1/17/2007	ND<2.30259	FALSE	FALSE
	7/31/2007	ND<2.30259	FALSE	FALSE
	1/23/2008	2.99573	FALSE	FALSE
	7/15/2008	ND<2.30259	FALSE	FALSE
	1/28/2009	3.09104	FALSE	FALSE
	7/29/2009	2.94444	FALSE	FALSE
	1/12/2010	2.3979	FALSE	FALSE
	7/21/2010	ND<2.30259	FALSE	FALSE
	1/27/2011	2.3979	FALSE	FALSE

Poisson Tolerance Limit

Parameter: Zinc, total

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

Poisson Count of 36 background measurements = 121.827
Degrees of Freedom = 245

95% Confidence Values

Chi-Squared Value (95% Confidence) = 282.511
Lambda (from Zack's formula) = 3.92377
Smallest Degrees of Freedom = 16
Upper Tolerance Limit (95%) = 7

99% Confidence Values

Chi-Squared Value (99% Confidence) = 299.417
Lambda (from Zack's formula) = 4.15856
Smallest Degrees of Freedom = 21
Upper Tolerance Limit (99%) = 9.5

	Date	Conc.	Significant 95%	Significant 99%
MW-4	9/9/1994	ND<3.91202	FALSE	FALSE
	10/28/1994	ND<3.91202	FALSE	FALSE
	1/6/1995	ND<3.91202	FALSE	FALSE
	2/24/1995	ND<3.91202	FALSE	FALSE
	7/17/1995	ND<3.91202	FALSE	FALSE
	1/23/1996	ND<3.91202	FALSE	FALSE
	7/25/1996	ND<3.91202	FALSE	FALSE
	1/14/1997	ND<3.91202	FALSE	FALSE
	7/11/1997	ND<3.91202	FALSE	FALSE
	1/21/1998	ND<3.91202	FALSE	FALSE
	7/27/1998	ND<3.91202	FALSE	FALSE
	1/6/1999	ND<3.91202	FALSE	FALSE
	6/29/1999	4.00733	FALSE	FALSE
	1/27/2000	3.91202	FALSE	FALSE
	7/17/2000	7.02287	TRUE	FALSE
	1/24/2001	4.74493	FALSE	FALSE
	7/11/2001	ND<3.91202	FALSE	FALSE
	1/10/2002	ND<3.91202	FALSE	FALSE
	7/8/2002	4.81218	FALSE	FALSE
	1/22/2003	4.14313	FALSE	FALSE
	7/7/2003	4.30407	FALSE	FALSE
	1/22/2004	ND<3.91202	FALSE	FALSE
	7/12/2004	ND<3.91202	FALSE	FALSE
	1/26/2005	ND<3.91202	FALSE	FALSE
	7/14/2005	ND<3.91202	FALSE	FALSE
	1/25/2006	ND<3.91202	FALSE	FALSE
	7/13/2006	ND<3.91202	FALSE	FALSE
	1/17/2007	ND<2.30259	FALSE	FALSE
	7/31/2007	ND<0.620576	FALSE	FALSE
	1/23/2008	ND<0.620576	FALSE	FALSE
	7/15/2008	ND<0.620576	FALSE	FALSE
	1/28/2009	ND<2.30259	FALSE	FALSE
	7/29/2009	3.4012	FALSE	FALSE
	1/12/2010	ND<2.30259	FALSE	FALSE
	7/21/2010	2.48491	FALSE	FALSE
	1/27/2011	3.43399	FALSE	FALSE
MW-3	9/9/1994	ND<3.91202	FALSE	FALSE
	10/28/1994	ND<3.91202	FALSE	FALSE
	1/6/1995	ND<3.91202	FALSE	FALSE
	2/24/1995	ND<3.91202	FALSE	FALSE
	7/17/1995	ND<3.91202	FALSE	FALSE
	1/23/1996	ND<3.91202	FALSE	FALSE
	7/25/1996	ND<3.91202	FALSE	FALSE
	1/14/1997	ND<3.91202	FALSE	FALSE
	7/11/1997	ND<3.91202	FALSE	FALSE
	1/21/1998	ND<3.91202	FALSE	FALSE
	7/27/1998	5.18739	FALSE	FALSE
	1/6/1999	5.84932	FALSE	FALSE
	6/29/1999	6.49527	FALSE	FALSE
	1/27/2000	6.62007	FALSE	FALSE
	7/17/2000	ND<3.91202	FALSE	FALSE
	1/24/2001	5.78074	FALSE	FALSE
	7/11/2001	6.34914	FALSE	FALSE

1/10/2002	5.4161	FALSE	FALSE
7/8/2002	6.06611	FALSE	FALSE
1/22/2003	5.63479	FALSE	FALSE
7/7/2003	7.00397	**TRUE**	FALSE
1/22/2004	5.33754	FALSE	FALSE
7/12/2004	4.83628	FALSE	FALSE
1/26/2005	4.46591	FALSE	FALSE
7/14/2005	5.0689	FALSE	FALSE
1/25/2006	4.04305	FALSE	FALSE
7/13/2006	ND<3.91202	FALSE	FALSE
1/17/2007	4.48864	FALSE	FALSE
7/31/2007	4.07754	FALSE	FALSE
1/23/2008	3.29584	FALSE	FALSE
7/15/2008	3.13549	FALSE	FALSE
1/28/2009	4.12713	FALSE	FALSE
7/29/2009	3.66356	FALSE	FALSE
1/12/2010	3.21888	FALSE	FALSE
7/21/2010	3.73767	FALSE	FALSE
1/27/2011	4.30407	FALSE	FALSE

Laboratory Analysis Report
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#: 6009

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON ,NC 28502

DATE COLLECTED: 01/27/11
DATE REPORTED : 02/11/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-1	MW-3	MW-4R	MW-6	MW-8	Analysis Date	Analyst	Method Code
PH (field measurement), Units			4.19	5.19	5.19	4.42		01/27/11	RJH	SM4500HB
BOD, mg/l	2.0	2.0	--- U	--- U	--- U	--- U		01/28/11	MPB	SM5210B
COD, mg/l	10.0	10.0	48	24	36	20		01/31/11	SEJ	HACH8000
Nitrate Nitrogen as N, mg/l	0.03	10.0	10.28	1.91 J	--- U	4.08 J		01/28/11	MPH	EPA353.2
Total Organic Carbon, mg/l	0.15	1.0	--- U	2.40	8.02	1.19		01/27/11	SEJ	SM5310C
Total Alkalinity, mg/l	1.0	1.0	--- U	1.0	21	--- U		01/28/11	MPB	SM2320B
Chloride, mg/l	5.0	5.0	7	--- U	5	--- U		01/28/11	HLB	SM4500-CLB
Sulfate, mg/l	5.0	250.0	--- U	--- U	5.0 J	24.9 J		02/02/11	SEJ	SM426C
Antimony, ug/l	0.22	6.0	--- U	0.2 J	--- U	--- U		02/02/11	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	--- U	6.8 J	4.4 J	--- U		02/02/11	CMF	EPA200.8
Barium, ug/l	0.03	100.0	63.4 J	64.2 J	23.9 J	58.4 J		02/02/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.1 J	0.3 J	0.2 J	0.1 J		02/02/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.1 J	0.1 J	0.1 J	0.1 J		02/02/11	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	1.8 J	0.7 J	0.7 J	0.6 J		02/02/11	CMF	EPA200.8
Copper, ug/l	0.03	10.0	0.1 J	1.3 J	1.2 J	--- U		02/02/11	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	0.2 J	5.8 J	4.8 J	--- U		02/02/11	CMF	EPA200.8
Iron, ug/l	13.8	300.0	567	24980	12750	816		02/07/11	ADD	SM3111B
Lead, ug/l	0.01	10.0	1.0 J	3.1 J	3.5 J	0.7 J		02/02/11	CMF	EPA200.8
Mercury, ug/l	0.08	0.20	--- U	--- U	--- U	--- U		02/02/11	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	1.7 J	0.6 J	0.9 J	0.2 J		02/02/11	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	--- U	0.5 J	0.6 J	0.5 J		02/02/11	CMF	EPA200.8
Silver, ug/l	0.03	10.0	--- U	0.1 J	--- U	--- U		02/02/11	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	0.1 J	0.1 J	0.1 J	0.1 J		02/02/11	CMF	EPA200.8
Tin, ug/l	0.11	100.0	0.2 J	0.8 J				02/02/11	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	0.5 J	13.4 J	13.8 J	0.8 J		02/02/11	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	9.1 J	74	31	4.4 J		02/02/11	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	9.6	404	125	24.0		01/27/11	RJH	SM2130B
Sulfide, ug/l	100	1000	--- U	--- U	--- U	--- U		02/02/11	LFJ	SM4500-S2D
Conductivity (at 25c), uMhos	1.0	1.0	130	38	102	94		01/27/11	RJH	SM2510B
Dissolved Oxygen, mg/l	0.1	0.1	7.46	8.66	1.98	2.44		01/27/11	RJH	SM4500OG
Temperature, °C			17.09	10.86	11.83	16.71		01/27/11	RJH	SM2550B
Static Water Level, feet			16.65	5.82	6.53	13.80	22.36	01/27/11	RJH	
Well Depth, feet			38.94	15.82	15.84	16.96		01/27/11	RJH	
Carbon Dioxide, mg/l	1.0	1.0	18	23	162	211		01/28/11	MPB	SM4500CO2C
ORP, mv			326.6	173.4	-16.9	25.74		01/27/11	RJH	SM2580B

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

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

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ID#: 6009

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON ,NC 28502

DATE COLLECTED: 01/27/11
DATE REPORTED : 02/11/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-9	MW-10	MW-11	MW-12	SW-1	Analysis Date	Analyst	Method Code
PH (field measurement), Units			5.11		4.63	4.37	4.69	01/27/11	RJH	SM4500HB
BOD, mg/l	2.0	2.0	--- U		--- U	--- U		01/28/11	MPB	SM5210B
COD, mg/l	10.0	10.0	25		17	45		01/31/11	SEJ	HACH8000
Nitrate Nitrogen as N, mg/l	0.03	10.0	2.90 J		1.94 J	0.47 J		01/28/11	MPH	EPA353.2
Total Organic Carbon, mg/l	0.15	1.0	3.91		--- U	10.76		01/27/11	SEJ	SM5310C
Total Alkalinity, mg/l	1.0	1.0	32		--- U	--- U		01/28/11	MPB	SM2320B
Chloride, mg/l	5.0	5.0	10		8	53		01/28/11	HLB	SM4500-CLB
Sulfate, mg/l	5.0	250.0	25.1 J		--- U	43.1 J		02/02/11	SEJ	SM426C
Antimony, ug/l	0.22	6.0	--- U		--- U	--- U	--- U	02/02/11	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	9 J		--- U	0.5 J	0.3 J	02/02/11	CMF	EPA200.8
Barium, ug/l	0.03	100.0	78.7 J		25.1 J	204	47.7 J	02/02/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.3 J		0.1 J	0.2 J	0.3 J	02/02/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.1 J		--- U	0.4 J	0.1 J	02/02/11	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	11		0.2 J	3.9 J	3.3 J	02/02/11	CMF	EPA200.8
Copper, ug/l	0.03	10.0	--- U		0.2 J	0.3 J	--- U	02/02/11	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	0.3 J		0.1 J	0.1 J	--- U	02/02/11	CMF	EPA200.8
Iron, ug/l	13.8	300.0	24390		794	317		02/07/11	ADD	SM3111B
Lead, ug/l	0.01	10.0	0.7 J		0.1 J	0.1 J	0.2 J	02/02/11	CMF	EPA200.8
Mercury, ug/l	0.08	0.20	--- U		--- U	0.09 J	--- U	02/02/11	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	2.3 J		--- U	4.8 J	3.5 J	02/02/11	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	--- U		--- U	2.3 J	--- U	02/02/11	CMF	EPA200.8
Silver, ug/l	0.03	10.0	--- U		--- U	--- U	--- U	02/02/11	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	0.1 J		--- U	--- U	--- U	02/02/11	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	3.3 J		0.8 J	0.4 J	0.5 J	02/02/11	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	8.6 J		2.1 J	3.9 J	64	02/02/11	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	109		9.57	5.14	4.52	01/27/11	RJH	SM2130B
Sulfide, ug/l	100	1000	--- U		--- U	--- U		02/02/11	LFJ	SM4500-S2D
Conductivity (at 25c), uMhos	1.0	1.0	146		47	330	151	01/27/11	RJH	SM2510B
Dissolved Oxygen, mg/l	0.1	0.1	2.29		2.55	2.68	11.26	01/27/11	RJH	SM4500OG
Temperature, °C			15.02		16.90	18.44	4.98	01/27/11	RJH	SM2550B
Static Water Level, feet			5.46	23.64	14.10	16.68		01/27/11	RJH	
Well Depth, feet			21.82		35.61	38.39		01/27/11	RJH	
Carbon Dioxide, mg/l	1.0	1.0	247		53	740		01/28/11	MPB	SM4500CO2C
ORP, mv			170.8		475.0	204.1	151.0	01/27/11	RJH	SM2580B

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

ID#: 6009

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON ,NC 28502

DATE COLLECTED: 01/27/11
DATE REPORTED : 02/11/11

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-3	Equipment Blank	Trip Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units			4.66			01/27/11	RJH	SM4500HB
Antimony, ug/l	0.22	6.0	--- U	--- U		02/02/11	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	1.4 J	0.2 J		02/02/11	CMF	EPA200.8
Barium, ug/l	0.03	100.0	47.4 J	0.2 J		02/02/11	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.1 J	--- U		02/02/11	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.1 J	--- U		02/02/11	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	0.7 J	--- U		02/02/11	CMF	EPA200.8
Copper, ug/l	0.03	10.0	0.1 J	0.1 J		02/02/11	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	0.2 J	--- U		02/02/11	CMF	EPA200.8
Lead, ug/l	0.01	10.0	0.8 J	0.1 J		02/02/11	CMF	EPA200.8
Mercury, ug/l	0.08	0.20	--- U	--- U		02/02/11	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	0.1 J	0.6 J		02/02/11	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	--- U	--- U		02/02/11	CMF	EPA200.8
Silver, ug/l	0.03	10.0	--- U	--- U		02/02/11	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	--- U	--- U		02/02/11	CMF	EPA200.8
Tin, ug/l	0.11	100.0		0.4 J		02/02/11	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	1.5 J	0.4 J		02/02/11	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	9.9 J	1.7 J		02/02/11	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	1.91			01/27/11	RJH	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	96			01/27/11	RJH	SM2510B
Dissolved Oxygen, mg/l	0.1	0.1	9.33			01/27/11	RJH	SM4500OG
Temperature, °C			3.02			01/27/11	RJH	SM2550B
ORP, mv			351.8			01/27/11	RJH	SM2580B

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: LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

CLIENT ID: 6009

ANALYST: MAO
DATE COLLECTED: 01/27/11
DATE REPORTED: 02/11/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 02/01/11 MW-1	01/28/11 MW-3	02/01/11 MW-4R	01/28/11 MW-6	01/28/11 MW-9
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- 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	--- U	--- 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	--- U	--- U	--- 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	--- 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	--- U	--- U	--- 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	1.40 J	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	3.00	--- 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	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	--- U	--- U	--- U	--- 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	--- U	--- 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, 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: LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

CLIENT ID: 6009

ANALYST: MAO
DATE COLLECTED: 01/27/11
DATE REPORTED: 02/11/11

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Date Analyzed: 02/01/11 MW-11	02/01/11 MW-12	02/01/11 SW-1	02/01/11 SW-3	02/01/11 Equipment Blank
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	0.70 J	--- 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	--- U	--- 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	--- U	--- U	--- 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	--- 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	--- U	1.50	--- 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	--- U	--- U	--- 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	--- U	--- 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, 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: LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

CLIENT ID: 6009

ANALYST: MAO
DATE COLLECTED: 01/27/11
DATE REPORTED: 02/11/11

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	Date Analyzed: MDL	SWSL	02/01/11 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	10.50 J
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	4.10 J
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	--- U
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 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: 6009 **Week: 8**

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																				
pH CHECK (LAB)			<2		<2				12		9					12				
CONTAINER TYPE, P/G	P	P	P	P	P	P	P	P	P	P	P	P	P	P		G				
CHEMICAL PRESERVATION	A	A	C	A	C	A	A	A	A	A	F D	A	A	A		E				
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	BOD	COD	Nitrate	TOC	Alkalinity	Chloride	Sulfate	Metals	Turbidity	Sulfide	Conductivity	DO	Temperature	Field Parameter	EPA 8260B	PARAMETERS
MW-1	01 27 11	1420		17.09	13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
MW-3	01 27 11	1140		10.86	12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
MW-4R	01 27 11	1105		11.83	13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
MW-6	01 27 11	1350		16.71	12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
MW-8	01 27 11				1															G		
MW-9	01 27 11	1210		15.02	12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
MW-10	01 27 11				1															G		
MW-11	01 27 11	1330		16.90	12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
MW-12	01 27 11	1250		18.44	12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
SW-1	01 27 11	0920		4.98	4	G								G	G		G	G	G		G	
SW-3	01 27 11	0900		3.02	4	G								G	G		G	G	G		G	

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) Hulgae / Fox

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob Hulgae	01 27 11	B	1/27 1420
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

№ 212453

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: 6009 **Week: 8**

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

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

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	BOD	COD	Nitrate	TOC	Alkalinity	Chloride	Sulfate	Metals	Turbidity	Sulfide	Conductivity	DO	Temperature	Field Parameter	EPA 8260B
CHLORINE NEUTRALIZED AT COLLECTION																					
pH CHECK (LAB)							<2		<2					>12		>9					<2
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P	P	P	P	P	P		G
CHEMICAL PRESERVATION						A	A	C	A	C	A	A	A	A	A	F D	A	A	A		E
Equipment Blank	01/27/11				3									C							C
Trip Blank					2																

PARAMETERS

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
- [X] SOLID WASTE SECTION

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

SAMPLES COLLECTED BY:
(Please Print)
N Lane / EOT

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob Hope	01/27/11	B	1/27 420
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

№ 212452

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: 6009 **Week: 8**

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

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

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	8260 Dup. 1	8260 Dup. 2	CO2	ORP
						12	12		
						G	G	P	P
						E	E	A	A
MW-1	01/27/11	1420		17.09	13	G	G	G	G
MW-3	01/27/11	1240		10.86	12	G		G	G
MW-4R	01/27/11	1105		11.83	13	G	G	G	G
MW-6	01/27/11	1350		16.71	12	G		G	G
MW-8					1				
MW-9	01/27/11	1210		15.02	12	G		G	G
MW-10					1				
MW-11	01/27/11	1330		16.90	12	G		G	G
MW-12	01/27/11	1250		18.44	12	G		G	G
SW-1	01/27/11	0920		4.98	4	G			G
SW-3	01/27/11	0900		3.08	4	G			G

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB)

CONTAINER TYPE, P/G

CHEMICAL PRESERVATION

PARAMETERS

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
- [X] SOLID WASTE SECTION

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

SAMPLES COLLECTED BY:
(Please Print)
H Lope / R Ot

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Rob H Lope	01/27/11	B	1/27 1420
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

№ 212451

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: 6009 **Week: 8**

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

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

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB): 12

CONTAINER TYPE, P/G: G G P P

CHEMICAL PRESERVATION: E E A A

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 AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	8260 Dup. 1	8260 Dup. 2	CO2	ORP
Equipment Blank 01	27 11				3	G			
Trip Blank					2				

PARAMETERS

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) H Lope / Fat

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob H Lope 01	27 11	B	1/21 1420
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

№ 212450

microseeps
from insight comes solutions

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Laboratory Results

Total pages in data package: 13

Lab Sample #	Client Sample ID
P1101316-01	MW-1
P1101316-02	MW-3
P1101316-03	MW-4R
P1101316-04	MW-6
P1101316-05	MW-9
P1101316-06	MW-11
P1101316-07	MW-12

Microseeps test results meet all the requirements of the NELAC standards or provide reasons and/or justification if they do not.

Approved By: Heather Hauser (DH) **Date:** 2-17-11

Project Manager: Heather Hauser

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email customerservice@microseeps.com.

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Case Narrative: Lactic acid was detected in the blank at a concentration above the reporting limit. The percent recovery for lactic acid for the MSD analysis was outside of control limits.
This report is being reissued 2/17/11 to include the batch QC.

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-1	Vapor	P1101316-01	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane	J	0.002	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene		0.011	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.610	0.600	nM	AM20GAX	2/8/11	gt
N Methane		0.590	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.018	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	BM	0.140	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-3	Vapor	P1101316-02	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane	U	< 0.010	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene	U	< 0.010	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.830	0.600	nM	AM20GAX	2/8/11	gt
N Methane		1.000	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.025	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	BM	0.130	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-4R	Vapor	P1101316-03	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane	U	< 0.010	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene	J	0.008	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.640	0.600	nM	AM20GAX	2/8/11	gt
N Methane		350.000	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.044	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	BM	0.120	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid		0.073	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb

PA02-00538

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Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-6	Vapor	P1101316-04	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane	J	0.003	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene	U	< 0.010	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.680	0.600	nM	AM20GAX	2/8/11	gt
N Methane		220.000	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.019	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	JBM	0.100	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid		0.067	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-9	Vapor	P1101316-05	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane		0.014	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene	J	0.003	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.770	0.600	nM	AM20GAX	2/8/11	gt
N Methane		40.000	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.024	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	BM	0.110	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-11	Vapor	P1101316-06	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane	J	0.003	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene	J	0.004	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.660	0.600	nM	AM20GAX	2/8/11	gt
N Methane		57.000	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.012	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	JBM	0.100	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Page: Page 9 of 13
Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW-12	Vapor	P1101316-07	27 Jan. 11	28 Jan. 11 10:30

Analyte(s)	Flag	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis							
N Ethane	U	< 0.010	0.010	ug/L	AM20GAX	2/8/11	gt
N Ethene		0.098	0.010	ug/L	AM20GAX	2/8/11	gt
N Hydrogen		0.720	0.600	nM	AM20GAX	2/8/11	gt
N Methane		550.000	0.015	ug/L	AM20GAX	2/8/11	gt
SemiVolatiles							
N Acetic Acid	J	0.044	0.070	mg/L	AM23G	2/1/11	kb
N Butyric Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Hexanoic Acid	U	< 0.050	0.050	mg/L	AM23G	2/1/11	kb
N i-Pentanoic Acid	U	< 0.150	0.150	mg/L	AM23G	2/1/11	kb
N Lactic Acid	BM	0.220	0.100	mg/L	AM23G	2/1/11	kb
N Pentanoic Acid	U	< 0.070	0.070	mg/L	AM23G	2/1/11	kb
N Propionic Acid		0.091	0.050	mg/L	AM23G	2/1/11	kb
N Pyruvic Acid	J	0.096	0.150	mg/L	AM23G	2/1/11	kb

PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Prep Method: Volatile Fatty Acids by Ion Chromatography
Analysis Method: Volatile Fatty Acids by Ion Chromatography

M110201019-MB

	Result		TrueSpikeConc.	RDL	%Recovery	Ctl Limits
Acetic Acid	< 0.070	mg/L		0.070		- NA
Propionic Acid	< 0.050	mg/L		0.050		- NA
Butyric Acid	< 0.050	mg/L		0.050		- NA
Lactic Acid	0.140	mg/L		0.100		- NA
Pyruvic Acid	< 0.150	mg/L		0.150		- NA
i-Pentanoic Acid	< 0.150	mg/L		0.150		- NA
Pentanoic Acid	< 0.070	mg/L		0.070		- NA
i-Hexanoic Acid	< 0.050	mg/L		0.050		- NA
Hexanoic Acid	< 0.050	mg/L		0.050		- NA

M110201019-LCS

	Result		TrueSpikeConc.		%Recovery	Ctl Limits
Acetic Acid	1.900	mg/L	2.00		95.00	70 - 130
Propionic Acid	1.900	mg/L	2.00		95.00	70 - 130
Butyric Acid	1.800	mg/L	2.00		90.00	70 - 130
Lactic Acid	2.200	mg/L	2.00		110.00	70 - 130
Pyruvic Acid	1.800	mg/L	2.00		90.00	70 - 130
i-Pentanoic Acid	1.700	mg/L	2.00		85.00	70 - 130
Pentanoic Acid	2.000	mg/L	2.00		100.00	70 - 130
i-Hexanoic Acid	2.000	mg/L	2.00		100.00	70 - 130
Hexanoic Acid	1.700	mg/L	2.00		85.00	70 - 130

P1101319-01A-MS

	Result		TrueSpikeConc.		%Recovery	Ctl Limits
Acetic Acid	2.200	mg/L	2.00		105.00	70 - 130
Propionic Acid	2.000	mg/L	2.00		100.00	70 - 130
Butyric Acid	1.800	mg/L	2.00		90.00	70 - 130
Lactic Acid	3.000	mg/L	2.00		128.00	70 - 130
Pyruvic Acid	1.800	mg/L	2.00		90.00	70 - 130
i-Pentanoic Acid	1.800	mg/L	2.00		90.00	70 - 130
Pentanoic Acid	2.000	mg/L	2.00		100.00	70 - 130
i-Hexanoic Acid	2.000	mg/L	2.00		100.00	70 - 130

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

P1101319-01A-MS

	Result		TrueSpikeConc.	%Recovery	Ctl Limits
Hexanoic Acid	2.200	mg/L	2.00	110.00	70 - 130

P1101319-01A-MSD

	Result		TrueSpikeConc.	%Recovery	Ctl Limits	RPD	RPD Ctl Limits
Acetic Acid	2.200	mg/L	2.00	105.00	70 - 130	0.00	0 - 30
Propionic Acid	2.000	mg/L	2.00	100.00	70 - 130	0.00	0 - 30
Butyric Acid	1.800	mg/L	2.00	90.00	70 - 130	0.00	0 - 30
Lactic Acid	3.200	mg/L	2.00	138.00	70 - 130	6.45	0 - 30
Pyruvic Acid	1.800	mg/L	2.00	90.00	70 - 130	0.00	0 - 30
i-Pentanoic Acid	1.600	mg/L	2.00	80.00	70 - 130	11.76	0 - 30
Pentanoic Acid	1.900	mg/L	2.00	95.00	70 - 130	5.13	0 - 30
i-Hexanoic Acid	1.800	mg/L	2.00	90.00	70 - 130	10.53	0 - 30
Hexanoic Acid	1.800	mg/L	2.00	90.00	70 - 130	20.00	0 - 30

Outlined Results indicate results outside of Control limits

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Prep Method: Hydrogen by Bubble Strip
Analysis Method: Hydrogen by Bubble Strip

M110208025-MB

	Result		TrueSpikeConc.	RDL	%Recovery	Ctl Limits
Hydrogen	< 0.600	nM		0.600		- NA

M110208025-LCS

	Result		TrueSpikeConc.	%Recovery	Ctl Limits
Hydrogen	51.000	nM	48.91	104.00	80 - 120

M110208025-LCSD

	Result		TrueSpikeConc.	%Recovery	Ctl Limits	RPD	RPD Ctl Limits
Hydrogen	52.000	nM	48.91	106.00	80 - 120	1.94	0 - 20

Outlined Results indicate results outside of Control limits

nelac PA02-00538

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1101316
Report Date: 02/09/11
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Prep Method: Light Hydrocarbons (C1-C4) by Bubblestrip
Analysis Method: Light Hydrocarbons (C1-C4) by Bubblestrip

M110208026-MB

	Result		TrueSpikeConc.	RDL	%Recovery	Ctl Limits
Ethane	< 0.010	ug/L		0.010		- NA
Ethene	< 0.010	ug/L		0.010		- NA
Methane	< 0.015	ug/L		0.015		- NA

M110208026-LCS

	Result		TrueSpikeConc.	%Recovery	Ctl Limits
Ethane	15.000	ug/L	13.59	110.00	80 - 120
Ethene	37.000	ug/L	32.57	114.00	80 - 120
Methane	17.000	ug/L	15.46	110.00	80 - 120

M110208026-LCSD

	Result		TrueSpikeConc.	%Recovery	Ctl Limits	RPD	RPD Ctl Limits
Ethane	15.000	ug/L	13.59	110.00	80 - 120	0.00	0 - 20
Ethene	37.000	ug/L	32.57	114.00	80 - 120	0.00	0 - 20
Methane	17.000	ug/L	15.46	110.00	80 - 120	0.00	0 - 20

[ ] Outlined Results indicate results outside of Control limits

Data Qualifiers: J - estimated value, U - Non detect, R - Poor surrogate recovery, M - Recovery/RPD poor for MS/MSD, SAMP/DUP, B - detected in blank, S - field sample as received did not meet NELAC sample acceptance criteria, L - Subcontracted Lab used, N - NELAC certified analysis

PA02-00538

Microseeps Lab. Proj. # P1101316

CHAIN - OF - CUSTODY RECORD

Microseeps COC cont. # 13

Phone: (412) 826-5245 Microseeps, Inc. - 220 William Pitt Way - Pittsburgh, PA 15238 Fax No.: (412) 826-3433

Company : ENVIRONMENT 1, INC

Co. Address : 114 OAKMONT DR, GREENVILLE, NC 27858

Phone # : 252-756-6208 Fax # : 252-756-0633

Proj. Manager : STEVE JONES

Proj. Name/Number : LENOIR COUNTY, NC

Sampler's signature : BOB HOPE

Cooler Temp. 4° 11/27

Results to : SAME

Invoice to : SAME

Sample ID	Sample Description	Sample Type Water	Vapor	Solid	Date	Time	Preserv.	HYDROGEN	LLUFA	METHANE/ETHANE/ETHENE	Remarks :
MW-1	MONITORING WELL #1	✓	✓		11/27/11			✓	✓	✓	
MW-3	MONITORING WELL #3	✓	✓					✓	✓	✓	PLEASE REPORT
MW-4R	MONITORING WELL #4R	✓	✓					✓	✓	✓	IN ELECTRONIC
MW-6	MONITORING WELL #6	✓	✓					✓	✓	✓	FORMAT
MW-9	MONITORING WELL #9	✓	✓					✓	✓	✓	
MW-11	MONITORING WELL #11	✓	✓					✓	✓	✓	FACILITY ID# 5403
MW-12	MONITORING WELL #12	✓	✓					✓	✓	✓	

Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
[illegible]	ENVIRONMENT 1	11/27/11	4:00	[illegible]	[illegible]	11/28	1000
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :

WHITE COPY : Accompany Samples YELLOW COPY : Laboratory File PINK COPY : Submitter

From: Debbie Hallo <dhallo@microseeps.com>
To: sjonese1 <sjonese1@aol.com>
Subject: Lenoir County
Date: Fri, Feb 18, 2011 3:55 pm

Hi Steve
Here is a reply from our Technical Director regarding the lactic acid in the blank

It is rare, but sometimes there are very low lactic acid false positives in the blanks. We have tried exhaustively to correct this, but it is an inconsistent problem, and it is painfully hard to correct a problem you can't reproduce! The analysis is intended to track injected carbon, and the high sensitivity helps track the outer edges of where the injection is reaching. Because there were no other substantial hits in any of the samples, it was clear that even with the B flag the results were conclusive. As such the report was issued, but the blank concentration was appropriately documented.

Debbie Hallo
Microseeps, Inc
220 William Pitt Way
Pittsburgh, PA 15238
Phone 412 826 5245
Fax 412 826 3433
www. microseeps.com
Check out our blog, Insituation, for discussions and insights into our cutting edge tools!