Groundwater Sampling Report and Statistical Analysis

Prepared for

Greene County Closed MSWLF and Active C&D Landfill
Walstonburg, North Carolina

September, 2006

Permit Number: 40-02
MESCO Project Number: G06010.0

Completed on February 2, 2007

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

OPERATION/CONSTRUCTION MANAGERS

Municipal Services

CIVIL/SANITARY ENGINEERS

Engineering Company, P.A.

February 2, 2007

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: Groundwater Sampling Report and Statistical Analysis
Greene County Closed MSWLF and C&D Landfill
Permit No. 40-02
MESCO Project No. G06010.0

Dear Ms. Drummond:

Municipal Engineering Company, P.A. (MESCO), has completed the sampling report and statistical analysis for the Greene County Closed MSWLF and active C&D Landfill for the September 21, 2006 sampling event. Environment I of Greenville NC completed the field sampling and laboratory analyses for the Appendix I list of metals and volatile organic constituents (VOCs) as part of the detection monitoring program. Samples were procured and analyzed from all monitoring locations which includes background well MW-1R, downgradient wells MW-4, MW-5, MW-6, and surface waters Upstream and Downstream. The laboratory results and statistical analysis are included herein.

All detected constituents were compared with North Carolina Groundwater Standards for regulatory exceedance. The results are shown in the enclosed table titled "Exceedance Scan". There were only a few constituents detected during this sampling event. Downgradient well MW-6 was found to contain chromium and lead with concentrations of lead detected above the NCGW2L Standard. A water sample procured from downgradient well MW-4 was found to contain the intermediate chlorinated hydrocarbons cis-1,2-dichloroethene and chloroethane in concentrations well below the MCL.

MESCO also completed the statistical analysis as required by the Solid Waste Section. The purpose of these analyses is to determine, in comparison to background levels, statistical significance of constituents detected within the downgradient wells during this sampling event.

Statistical Analysis Methodology

Metals

An inter-well statistical analysis was conducted upon metals detected during this sampling event. Monitoring well MW-1R was defined as the background well, and 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 (Table 1) summarizes the methods used for four different %ND ranges.

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

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.

A total of 2 metals were tested for statistical significance. For chromium and lead, the non-parametric tolerance interval method with ½ ND substitution was utilized because the data was not normally distributed when evaluated via the Shapiro Wilks normality test..

VOCs

All historical VOC detections in the background well MW-1R was pooled in order to determine the total number of detections, from which the expected number of detections in a single down gradient 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 students 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).

Results

Historical data compiled for monitoring well MW-1R was used as the baseline. Data distribution and potential outliers were reviewed using time series and box and whiskers plots (enclosed charts). Neither chromium nor lead within MW-6 were found to have increased compared to background levels through interwell comparison analysis.

Based upon the complete lack of historical VOC detections within the background well every well that contained a single VOC detection is considered to be statistically significant according to the Poisson Prediction Interval at a 95% confidence level. Downgradient well MW-4 continues to be the only well sitewide to contain a VOC detection and this is the premier event that another VOC other than cis-1,2-Dichloroethene has been found. Since chloroethane is a daughter product of the biodegradation of cis-,2-Dichloroethene it is apparent that natural attenuation is progressing.

Conclusion

Although the detection of cis-1,2-dichloroethene and its daughter product chloroethane within MW-4 is statistically significant at a 95% confidence level the concentrations remain only slightly above the detection limit. Given the observed low concentrations and the inferred direction of flow it is unlikely that purgeable halocarbons would be found in concentrations above the Standard at the compliance boundary.

MESCO completed the enclosed potentiometric map with groundwater elevations on the day of sampling, flow rates and direction. The site is scheduled to be sampled again for the new complete list of C&D parameters utilizing the newly promulgated detection limits in March 2007. Please contact me either by phone at (919) 772-5393, or by email at jpfohl@mesco.com should you have any questions or concerns regarding this report.

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

Jonathan Pfohl
Environmental Specialist

Enclosures
cc: Mr. David Jones
Greene County

Exceedance Scan
Greene County Closed MSWLF and C&D Landfill

Well ID	Parameter Name[1]	Sample Date	Result	Unit	PQL[2]	NCGW2L[3]	Exceedance
MW-6	Chromium	09/21/2006	0.015	mg/l	0.01	0.05	
MW-6	**Lead**	**09/21/2006**	**0.03**	**mg/l**	**0.01**	**0.015**	**0.015**
MW-4	Chloroethane	09/21/2006	20.1	ug/l	10		
MW-4	Cis-1,2-Dichloroethene	09/21/2006	14.3	ug/l	5	70	

[1] Table only contains detected constituents.
[2] PQL = Practical Quantitation Limit
[3] NCGW2L = North Carolina Ground Water 2L Standard

Hydrologic Properties at Monitoring Well Locations
Greene County Closed MSWLF and C&D Landfill

Monitoring Well	Hydraulic Conductivity (cm/sec)	Effective Porosity (%)	Hydraulic Gradient	Flow Rate (ft/yr)	Flow Direction	Water Table Depth (ft)	Water Table Elev. (ft)
MW-1R	1.20E-04	37%	0.018	5.9	N48E	4.58	117.2
MW-4	1.10E-04	40%	0.038	10.7	S70E	13.27	104.62
MW-5	1.40E-04	37%	0.026	10.3	N16E	14.67	101.09
MW-6	1.90E-04	43%	0.026	12.0	N17E	5.56	111.85

NOTE: Data for hydraulic conductivities obtained from GAI Consultants' WaterQuality Modifications (October, 1994)

Hydrologic Gradient taken from the October 21, 2006 sampling event.

Flow 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

Statistical Analysis Results Summary

Inter-Well Analysis Summary
Greene County Closed Sanitary Landfill
Background Well: (MW-1R)

Chromium, total

%ND	Normality	Method	ND Adj.	Upper Limit (a = 95%)	Unit
50.00	no	Non-Parametric Tolerance Limit	1/2 ND	40	ug/l

Well	Result	Significance
MW-6	13	no

Lead, total

%ND	Normality	Method	ND Adj.	Upper Limit (a = 95%)	Unit
69.23	no	Non-Parametric Tolerance Limit	1/2 ND	32	ug/l

Well	Result	Significance
MW-6	**13**	**no**

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

Summary of Pooled Appendix I VOCs in Background Well (MW-1R)
Greene County Closed Sanitary Landfill

Constituent	Samples	NDs	% NDs
1,1,1,2-Tetrachloroethane	26	26	100.00
1,1,1-Trichloroethane	26	26	100.00
1,1,2,2-Tetrachloroethane	26	26	100.00
1,1,2-Trichloroethane	26	26	100.00
1,1-Dichloroethane	26	26	100.00
1,1-Dichloroethene	26	26	100.00
1,2,3-Trichloropropane	26	26	100.00
1,2-Dibromo-3-chloropropane	26	26	100.00
1,2-Dibromoethane	26	26	100.00
1,2-Dichlorobenzene	26	26	100.00
1,2-Dichloroethane	26	26	100.00
1,2-Dichloropropane	26	26	100.00
1,4-Dichlorobenzene	26	26	100.00
2-Butanone	26	26	100.00
2-Hexanone	26	26	100.00
4-Methyl-2-Pentanone	26	26	100.00
Acetone	26	26	100.00
Acrylonitrile	26	26	100.00
Benzene	26	26	100.00
Bromochloromethane	26	26	100.00
Bromodichloromethane	26	26	100.00
Bromoform	26	26	100.00
Bromomethane	26	26	100.00
Carbon disulfide	26	26	100.00
Carbon tetrachloride	26	26	100.00
Chlorobenzene	26	26	100.00
Chloroethane	26	26	100.00
Chloroform	26	26	100.00
Chloromethane	26	26	100.00
cis-1,2-Dichloroethene	26	26	100.00
cis-1,3-Dichloropropene	26	26	100.00
Chlorodibromomethane	26	26	100.00
Dibromomethane	26	26	100.00
Ethylbenzene	26	26	100.00
Iodomethane	26	26	100.00
Dichloromethane	26	26	100.00
Styrene	26	26	100.00
Tetrachloroethylene	26	26	100.00
Toluene	26	26	100.00
trans-1,2-Dichloroethene	26	26	100.00
trans-1,3-Dichloropropene	26	26	100.00
trans-1,4-Dichloro-2-butene	26	26	100.00
Trichloroethylene	26	26	100.00
Trichlorofluoromethane	26	26	100.00
Vinyl acetate	26	26	100.00
Vinyl chloride	26	26	100.00
Xylene	26	26	100.00
Total	**1222**	**1222**	**100.00**

Poisson Prediction Interval Based upon Pooled Background Appendix I VOCs
Greene County Closed Sanitary Landfill

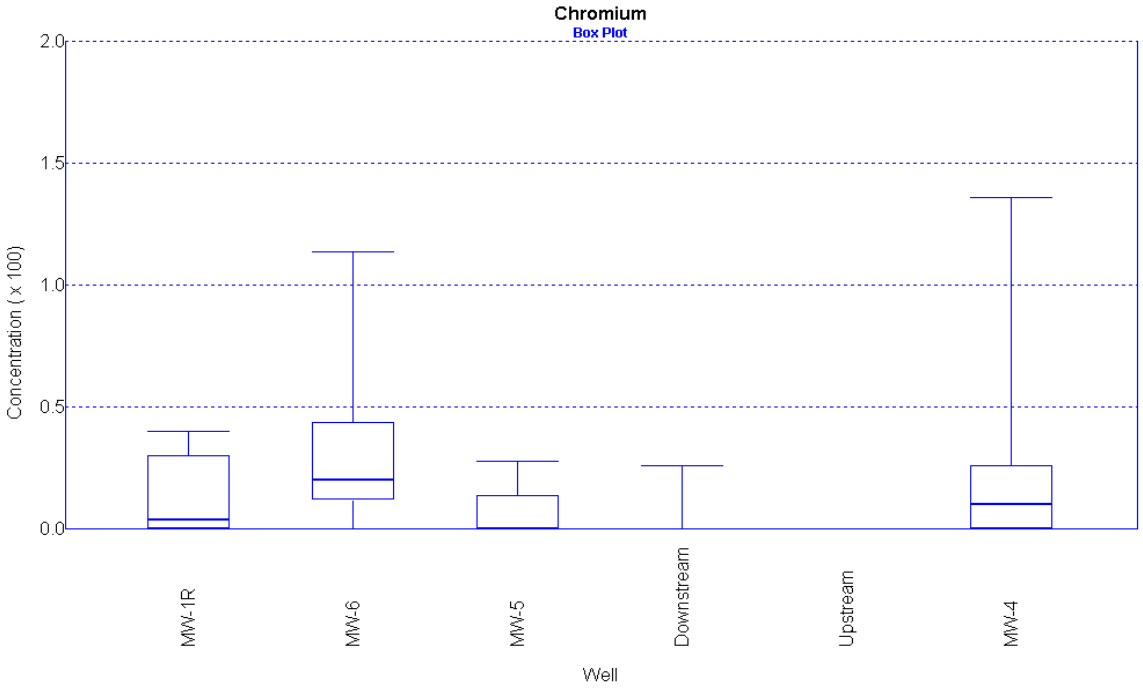
All detected VOCs (Background Well: MW-1)

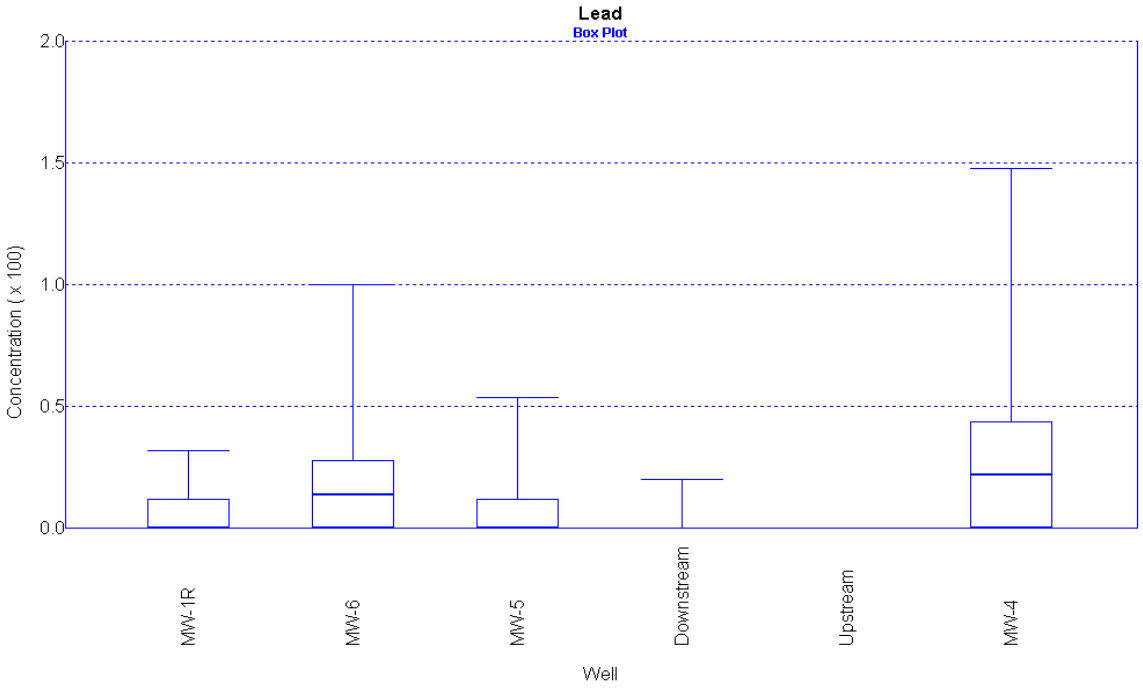
Constituent	MW-4
Chloroethane	x
Cis-1,2-Dichloroethene	x
Detection(s) per Scan	2.00

Total number of sampling events [n] =	26
Total number of detections in background wells [y] =	0
Number of comparisons (downgradient wells) [k] =	3
One-sided value of Student's t-statistic (95% confidence) [t] =	1.49
Expected number of detections in a single future sample [y*] =	**0.0855**

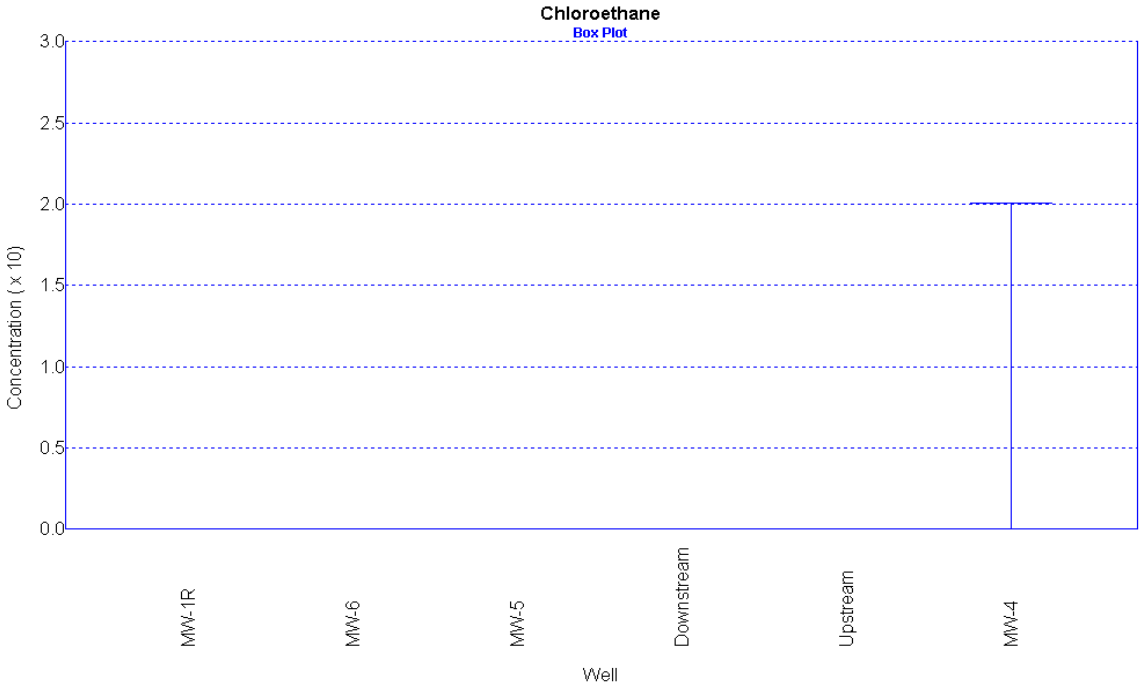
Statistically Significant VOC detections within MW-4 at a 95% confidence level

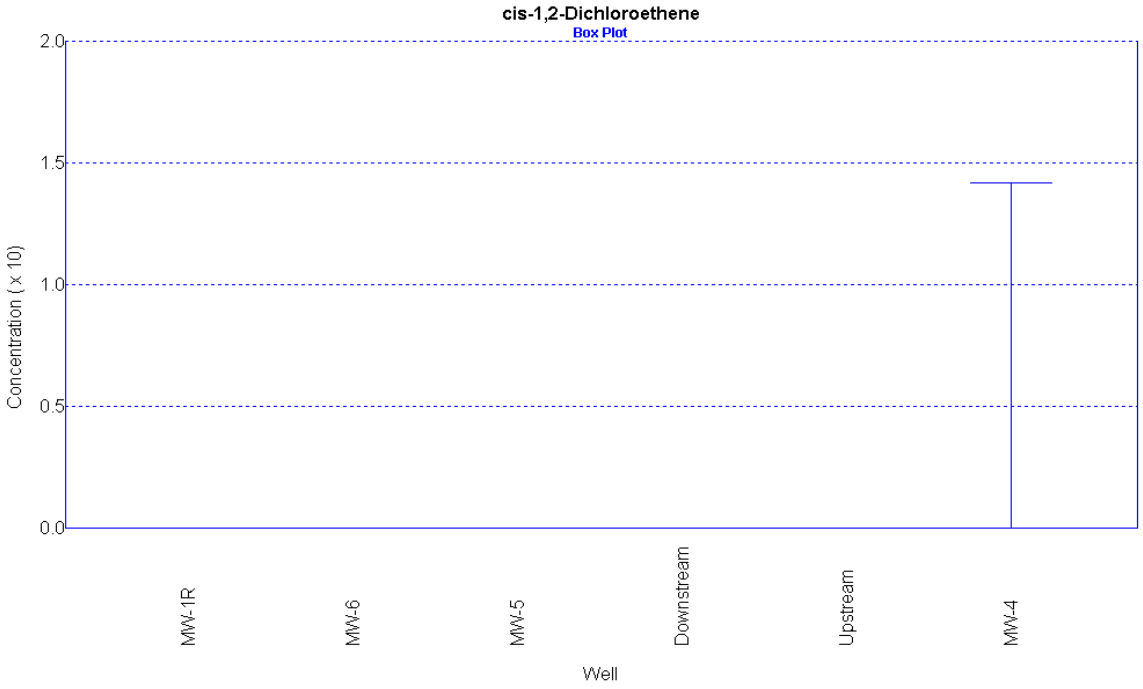
Box Plots for Select Constituents
Greene County Closed Sanitary Landfill



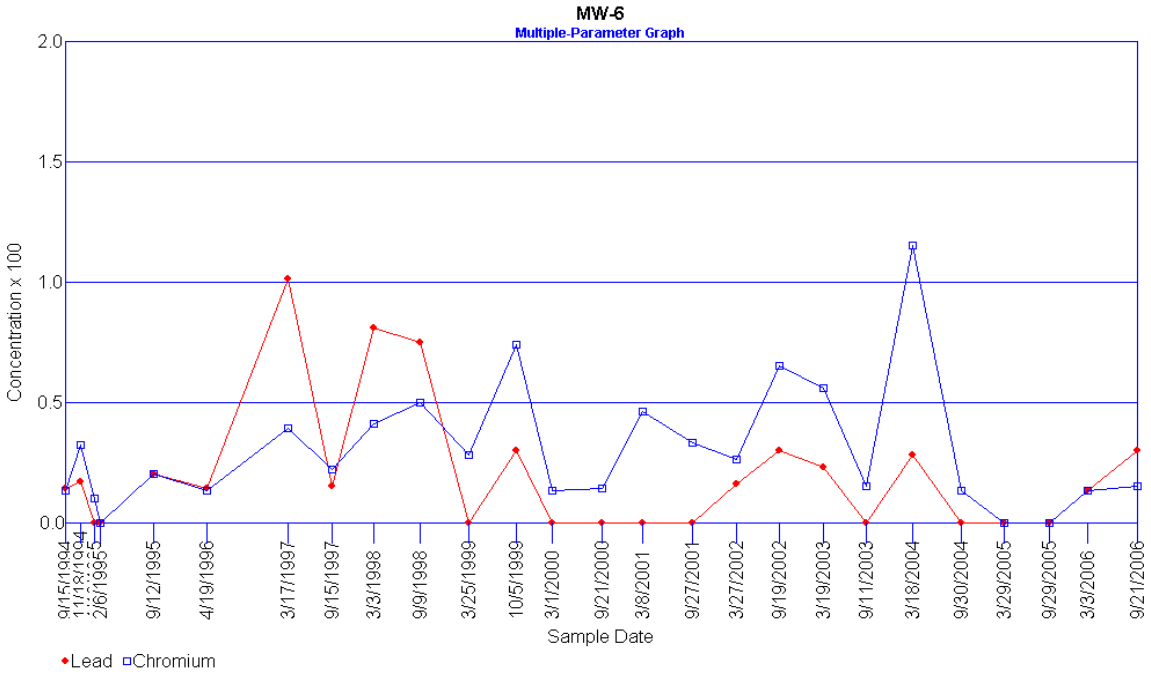


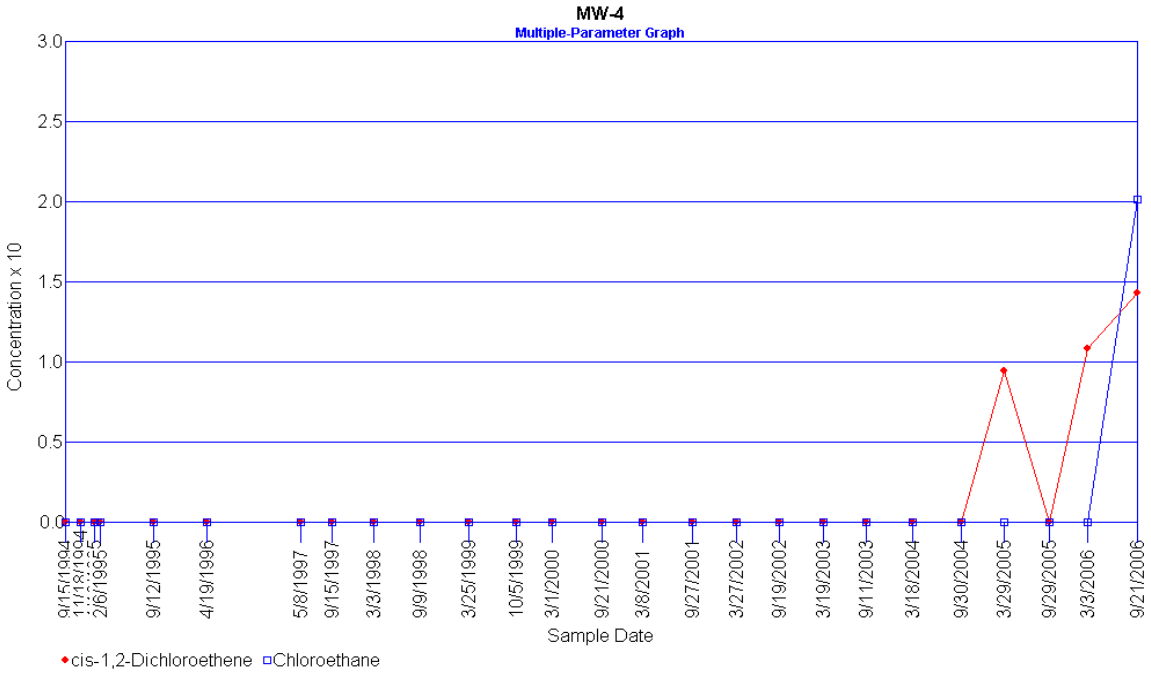
Box Plots for Select Constituents
Greene County Closed Sanitary Landfill





Time Series Plots for Select Constituents
Greene County Closed Sanitary Landfill





Basic Statistics

Basic Statistics

Parameter: Chromium

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

	Total Observations
145	
Total Non-Detects	85
Pooled Mean	15.1103
Pooled Std Dev	19.1526
Background Mean	15.5385
Background Std Dev	13.2853

Background Wells

There is 1 background well

Well	Samples	Non-Detects	% ND	Total
MW-1R	26	13	50	404

Well	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1R	15.5385	13.2853	0	2073	79.7308

Compliance Wells

There are 5 compliance wells

Well	Samples	Non-Detects	% ND	Total
MW-4	26	12	46.1538	528
MW-5	26	17	65.3846	252
MW-6	26	3	11.5385	781
Downstream	23	22	95.6522	136
Upstream	18	18	100	90

Well	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-4	20.3077	27.5895	4.76923	4.80801	2138	82.2308
MW-5	9.69231	7.39064	-5.84615	4.80801	1691	65.0385
MW-6	30.0385	25.7239	14.5	4.80801	2843	109.346
Downstream	5.91304	4.3788	-9.62542	4.96232	1066	46.3478
Upstream	5	0	-10.5385	5.31545	774	43

Analysis of Variance Statistics

SS Wells	11049.9
SS Total	52822.2

Kruskal-Wallis Statistics

Non-Detect Rank	43
Background Rank Sum	2073
Background Rank Mean	79.7308
H Statistic	40.7706
H Adjusted for Ties	51.0542

Basic Statistics

Parameter: Chloroethane

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

	Total Observations
145	
Total Non-Detects	144
Pooled Mean	5.10414
Pooled Std Dev	1.25399
Background Mean	5
Background Std Dev	0

Background Wells

There is 1 background well

Well	Samples	Non-Detects	% ND	Total
MW-1R	26	26	100	130

Well	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1R	5	0	0	1885	72.5

Compliance Wells

There are 5 compliance wells

Well	Samples	Non-Detects	% ND	Total
MW-4	26	25	96.1538	145.1
MW-5	26	26	100	130
MW-6	26	26	100	130
Downstream	23	23	100	115
Upstream	18	18	100	90

Well	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-4	5.58077	2.96135	0.580769	0.348322	1957.5	75.2885
MW-5	5	0	0	0.348322	1885	72.5
MW-6	5	0	0	0.348322	1885	72.5
Downstream	5	0	0	0.359501	1667.5	72.5
Upstream	5	0	0	0.385085	1305	72.5

Analysis of Variance Statistics

SS Wells	7.19713
SS Total	226.438

Kruskal-Wallis Statistics

Non-Detect Rank	72.5
Background Rank Sum	1885
Background Rank Mean	72.5
H Statistic	0.0940464
H Adjusted for Ties	4.57692

Basic Statistics

Parameter: Lead

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

	Total Observations
145	
Total Non-Detects	93
Pooled Mean	14.3931
Pooled Std Dev	20.894
Background Mean	8.76923
Background Std Dev	7.01603

Background Wells

There is 1 background well

Well	Samples	Non-Detects	% ND	Total
MW-1R	26	18	69.2308	228

Well	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1R	8.76923	7.01603	0	1723	66.2692

Compliance Wells

There are 5 compliance wells

Well	Samples	Non-Detects	% ND	Total
MW-4	26	7	26.9231	807
MW-5	26	17	65.3846	269
MW-6	26	11	42.3077	562
Downstream	23	22	95.6522	131
Upstream	18	18	100	90

Well	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-4	31.0385	34.037	22.2692	5.24594	2699	103.808
MW-5	10.3462	11.0125	1.57692	5.24594	1804	69.3846
MW-6	21.6154	25.5015	12.8462	5.24594	2360	90.7692
Downstream	5.69565	3.33623	-3.07358	5.4143	1153	50.1304
Upstream	5	0	-3.76923	5.79961	846	47

Analysis of Variance Statistics

SS Wells	13136.1
SS Total	62864.6

Kruskal-Wallis Statistics

Non-Detect Rank	47
Background Rank Sum	1723
Background Rank Mean	66.2692
H Statistic	33.2176
H Adjusted for Ties	45.1219

Basic Statistics

Parameter: cis-1,2-Dichloroethene

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

	Total Observations
145	
Total Non-Detects	142
Pooled Mean	2.68621
Pooled Std Dev	1.31949
Background Mean	2.5
Background Std Dev	0

Background Wells

There is 1 background well

Well	Samples	Non-Detects	% ND	Total
MW-1R	26	26	100	65

Well	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1R	2.5	0	0	1859	71.5

Compliance Wells

There are 5 compliance wells

Well	Samples	Non-Detects	% ND	Total
MW-4	26	23	88.4615	92
MW-5	26	26	100	65
MW-6	26	26	100	65
Downstream	23	23	100	57.5
Upstream	18	18	100	45

Well	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-4	3.53846	3.01796	1.03846	0.35498	2076.5	79.8654
MW-5	2.5	0	0	0.35498	1859	71.5
MW-6	2.5	0	0	0.35498	1859	71.5
Downstream	2.5	0	0	0.366373	1644.5	71.5
Upstream	2.5	0	0	0.392445	1287	71.5

Analysis of Variance Statistics

SS Wells	23.0109
SS Total	250.712

Kruskal-Wallis Statistics

Non-Detect Rank	71.5
Background Rank Sum	1859
Background Rank Mean	71.5
H Statistic	0.846417
H Adjusted for Ties	13.9224

Interwell Analyses for Metals

Non-Parametric Tolerance Interval

Parameter: Chromium

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

Total Percent Non-Detects = 30.7692%
Background Samples (n) = 26
Maximum Background Concentration = 40
Minimum Coverage = 89.1%
Average Coverage = 96.2963%

Well	Sample	Result	Impacted
MW-6	9/15/1994	13	FALSE
MW-6	11/18/1994	32	FALSE
MW-6	1/12/1995	10	FALSE
MW-6	2/6/1995	ND<5	FALSE
MW-6	9/12/1995	20	FALSE
MW-6	4/19/1996	13	FALSE
MW-6	3/17/1997	39	FALSE
MW-6	9/15/1997	22	FALSE
MW-6	3/3/1998	41	TRUE
MW-6	9/9/1998	50	TRUE
MW-6	3/25/1999	28	FALSE
MW-6	10/5/1999	74	TRUE
MW-6	3/1/2000	13	FALSE
MW-6	9/21/2000	14	FALSE
MW-6	3/8/2001	46	TRUE
MW-6	9/27/2001	33	FALSE
MW-6	3/27/2002	26	FALSE
MW-6	9/19/2002	65	TRUE
MW-6	3/19/2003	56	TRUE
MW-6	9/11/2003	15	FALSE
MW-6	3/18/2004	115	TRUE
MW-6	9/30/2004	13	FALSE
MW-6	3/29/2005	ND<5	FALSE
MW-6	9/29/2005	ND<5	FALSE
MW-6	3/3/2006	13	FALSE
MW-6	9/21/2006	15	FALSE

Non-Parametric Tolerance Interval

Parameter: Lead

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

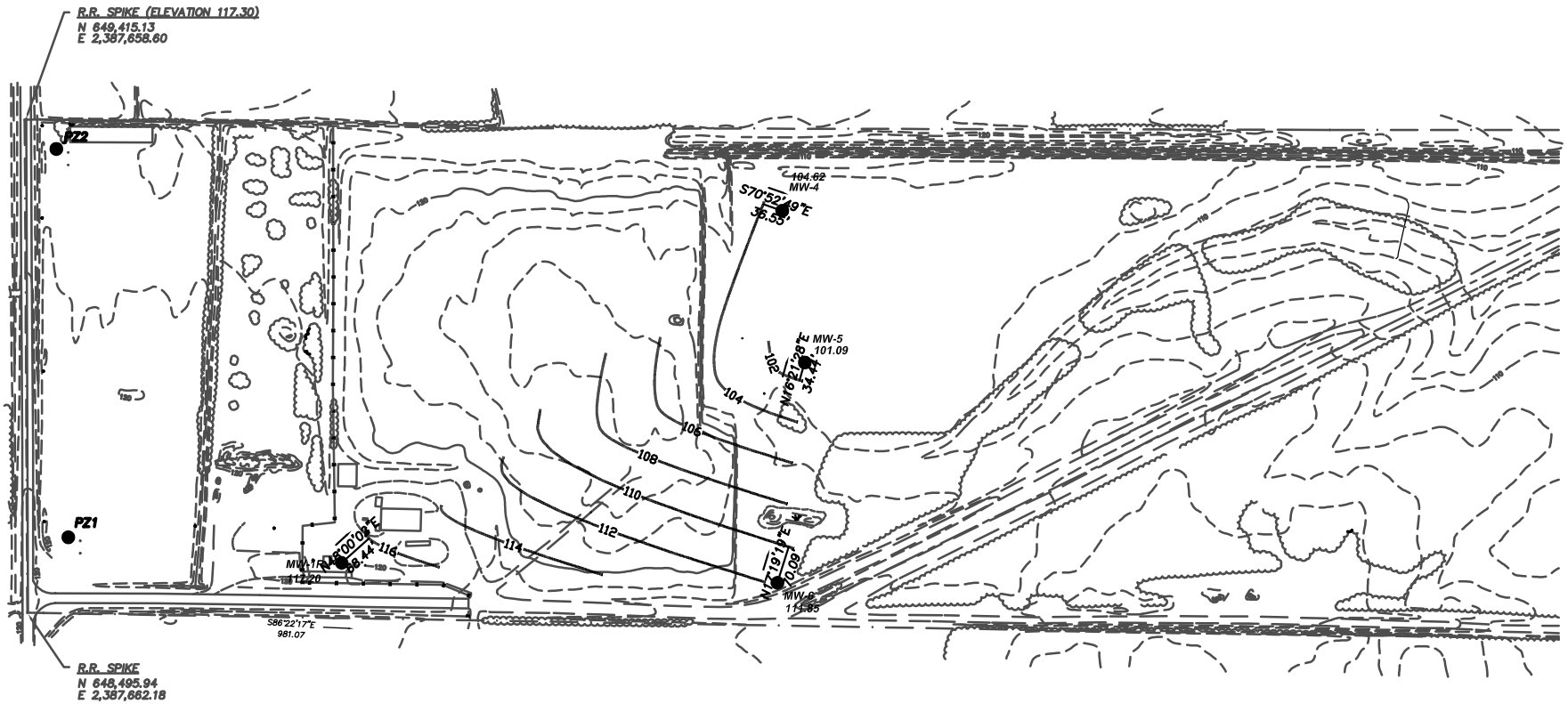
Total Percent Non-Detects = 55.7692%
Background Samples (n) = 26
Maximum Background Concentration = 32
Minimum Coverage = 89.1%
Average Coverage = 96.2963%

Well	Sample	Result	Impacted
MW-6	9/15/1994	14	FALSE
MW-6	11/18/1994	17	FALSE
MW-6	1/12/1995	ND<5	FALSE
MW-6	2/6/1995	ND<5	FALSE
MW-6	9/12/1995	20	FALSE
MW-6	4/19/1996	14	FALSE
MW-6	3/17/1997	101	TRUE
MW-6	9/15/1997	15	FALSE
MW-6	3/3/1998	81	TRUE
MW-6	9/9/1998	75	TRUE
MW-6	3/25/1999	ND<5	FALSE
MW-6	10/5/1999	30	FALSE
MW-6	3/1/2000	ND<5	FALSE
MW-6	9/21/2000	ND<5	FALSE
MW-6	3/8/2001	ND<5	FALSE
MW-6	9/27/2001	ND<5	FALSE
MW-6	3/27/2002	16	FALSE
MW-6	9/19/2002	30	FALSE
MW-6	3/19/2003	23	FALSE
MW-6	9/11/2003	ND<5	FALSE
MW-6	3/18/2004	28	FALSE
MW-6	9/30/2004	ND<5	FALSE
MW-6	3/29/2005	ND<5	FALSE
MW-6	9/29/2005	ND<5	FALSE
MW-6	3/3/2006	13	FALSE
MW-6	9/21/2006	30	FALSE

LEGEND

- EXISTING DIVERSION DITHC
- 2670 EXISTING CONTOURS
- BOUNDRY
- MW1 MONITORING WELL
- PZ1 PIEZOMETER
- EQUIPOTENTIAL CONTOURS

MW	EASTING	NORTHING	TOP OF PIPE ELEVATION	GROUND ELEVATION
MW1	2388246.5017	648587.3426	TOP OF PIPE 121.78	GROUND 119.79
MW4	2389067.3113	649243.8360	TOP OF PIPE 117.89	GROUND 115.14
MW5	2389101.3891	648960.8934	TOP OF PIPE 115.76	GROUND 113.16
MW6	2389058.2699	648550.1348	TOP OF PIPE 117.41	GROUND 114.54
PZ1	2387737.0934	648635.0002	TOP OF PIPE 122.72	GROUND 119.86
PZ2	2387714.7325	649358.9129	TOP OF PIPE 119.59	GROUND 116.58



Greene County Closed Landfill September 21, 2006

WELL #	TOP OF PIPE ELEVATION (FT)	DEPTH TO WATER (FT)	WATER ELEVATION (FT)
MW-1R	121.78	4.58	117.2
MW-4	117.89	13.27	104.62
MW-5	115.76	14.67	101.09
MW-6	117.41	5.56	111.85

Municipal Services Engineering Company, P.A.

PO BOX 1000 GREENVILLE, NC 27835
(252) 756-2037 FAX (252) 756-2038

GREENE COUNTY
CLOSED SANITARY LANDFILL
GREENE COUNTY
NORTH CAROLINA

SINGLE DAY POTENTIOMETRIC MAP

DATE	BY	REV.	DESCRIPTION

SCALE: 1"=100'
DATE: 6/21/2001
DRWN. BY: C. SEYMOUR
CHKD. BY: K. YOSHIDA
PROJECT NUMBER
601011.0
DRAWING NO.
SHEET NO.

Laboratory Results

Environment 1, Incorporated

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

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

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6005

GREENE CO. LANDFILL
DAVID JONES
P.O. BOX 543
SNOW HILL ,NC 28580

DATE COLLECTED: 09/21/06
DATE REPORTED : 10/02/06

REVIEWED BY:

PARAMETERS	Upstream	Downstream	Well #4	Well #5	Well #6	Analysis Date	Analyst	Method Code
PH (field measurement), Units	5.8	6.2	5.4	5.2	5.0	09/21/06	RJH	EPA150.1
Antimony, mg/l	<0.030	<0.030	<0.030	<0.030	<0.030	09/26/06	CMF	EPA200.8
Arsenic, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010	09/26/06	CMF	EPA200.8
Barium, mg/l	<0.500	<0.500	<0.500	<0.500	<0.500	09/26/06	CMF	EPA200.8
Beryllium, mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	09/26/06	CMF	EPA200.8
Cadmium, mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	09/26/06	CMF	EPA200.8
Cobalt, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010	09/26/06	CMF	EPA200.8
Copper, mg/l	<0.200	<0.200	<0.200	<0.200	<0.200	09/26/06	CMF	EPA200.8
Total Chromium, mg/l	<0.010	<0.010	<0.010	<0.010	0.015	09/26/06	CMF	EPA200.8
Lead, mg/l	<0.010	<0.010	<0.010	<0.010	0.030	09/26/06	CMF	EPA200.8
Nickel, mg/l	<0.050	<0.050	<0.050	<0.050	<0.050	09/26/06	CMF	EPA200.8
Selenium, mg/l	<0.020	<0.020	<0.020	<0.020	<0.020	09/26/06	CMF	EPA200.8
Silver, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010	09/26/06	CMF	EPA200.8
Thallium, mg/l	<0.010	<0.010	<0.010	<0.010	<0.010	09/26/06	CMF	EPA200.8
Vanadium, mg/l	<0.040	<0.040	<0.040	<0.040	<0.040	09/26/06	CMF	EPA200.8
Zinc, mg/l	<0.050	<0.050	<0.050	<0.050	<0.050	09/26/06	CMF	EPA200.8
Conductivity (at 25c), uMhos	82	269	260	131	46	09/21/06	RJH	SM2510B
Temperature, °C	17	19	21	20	20	09/21/06	RJH	SM2550B
Static Water Level, feet			13.27	14.67	5.56	09/21/06	RJH	
Well Depth, feet			26.16	28.34	26.87	09/21/06	RJH	

Environment 1, Incorporated

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

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

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6005

GREENE CO. LANDFILL
DAVID JONES
P.O. BOX 543
SNOW HILL ,NC 28580

DATE COLLECTED: 09/21/06
DATE REPORTED : 10/02/06

REVIEWED BY:

PARAMETERS	Well #1R	Equipment Blank	Trip Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units	4.4			09/21/06	RJH	EPA150.1
Antimony, mg/l	<0.030	<0.030		09/26/06	CMF	EPA200.8
Arsenic, mg/l	<0.010	<0.010		09/26/06	CMF	EPA200.8
Barium, mg/l	<0.500	<0.500		09/26/06	CMF	EPA200.8
Beryllium, mg/l	<0.002	<0.002		09/26/06	CMF	EPA200.8
Cadmium, mg/l	<0.001	<0.001		09/26/06	CMF	EPA200.8
Cobalt, mg/l	<0.010	<0.010		09/26/06	CMF	EPA200.8
Copper, mg/l	<0.200	<0.200		09/26/06	CMF	EPA200.8
Total Chromium, mg/l	<0.010	<0.010		09/26/06	CMF	EPA200.8
Lead, mg/l	<0.010	<0.010		09/26/06	CMF	EPA200.8
Nickel, mg/l	<0.050	<0.050		09/26/06	CMF	EPA200.8
Selenium, mg/l	<0.020	<0.020		09/26/06	CMF	EPA200.8
Silver, mg/l	<0.010	<0.010		09/26/06	CMF	EPA200.8
Thallium, mg/l	<0.010	<0.010		09/26/06	CMF	EPA200.8
Vanadium, mg/l	<0.040	<0.040		09/26/06	CMF	EPA200.8
Zinc, mg/l	<0.050	<0.050		09/26/06	CMF	EPA200.8
Conductivity (at 25c), uMhos	484			09/21/06	RJH	SM2510B
Temperature, °C	24			09/21/06	RJH	SM2550B
Static Water Level, feet	4.58			09/21/06	RJH	
Well Depth, feet	19.51			09/21/06	RJH	

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: GREENE CO. LANDFILL
DAVID JONES
P.O. BOX 543
SNOW HILL, NC 28580

CLIENT ID: 6005

ANALYST: MAO
DATE COLLECTED: 09/21/06
DATE ANALYZED: 09/26/06
DATE REPORTED: 10/02/06

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	Upstream	Downstream	Well #4	Well #5	Well #6
1. Chloromethane	<10.00	<10.00	<10.00	<10.00	<10.00
2. Vinyl Chloride	<10.00	<10.00	<10.00	<10.00	<10.00
3. Bromomethane	<10.00	<10.00	<10.00	<10.00	<10.00
4. Chloroethane	<10.00	<10.00	20.10	<10.00	<10.00
5. Trichlorofluoromethane	<5.00	<5.00	<5.00	<5.00	<5.00
6. 1,1-Dichloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
7. Acetone	<100.00	<100.00	<100.00	<100.00	<100.00
8. Iodomethane	<10.00	<10.00	<10.00	<10.00	<10.00
9. Carbon Disulfide	<100.00	<100.00	<100.00	<100.00	<100.00
10. Methylene Chloride	<10.00	<10.00	<10.00	<10.00	<10.00
11. trans-1,2-Dichloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
12. 1,1-Dichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
13. Vinyl Acetate	<50.00	<50.00	<50.00	<50.00	<50.00
14. Cis-1,2-Dichloroethene	<5.00	<5.00	14.30	<5.00	<5.00
15. 2-Butanone	<100.00	<100.00	<100.00	<100.00	<100.00
16. Bromochloromethane	<5.00	<5.00	<5.00	<5.00	<5.00
17. Chloroform	<5.00	<5.00	<5.00	<5.00	<5.00
18. 1,1,1-Trichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
19. Carbon Tetrachloride	<10.00	<10.00	<10.00	<10.00	<10.00
20. Benzene	<5.00	<5.00	<5.00	<5.00	<5.00
21. 1,2-Dichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
22. Trichloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
23. 1,2-Dichloropropane	<5.00	<5.00	<5.00	<5.00	<5.00
24. Bromodichloromethane	<5.00	<5.00	<5.00	<5.00	<5.00
25. Cis-1,3-Dichloropropene	<10.00	<10.00	<10.00	<10.00	<10.00
26. 4-Methyl-2-Pentanone	<100.00	<100.00	<100.00	<100.00	<100.00
27. Toluene	<5.00	<5.00	<5.00	<5.00	<5.00
28. trans-1,3-Dichloropropene	<10.00	<10.00	<10.00	<10.00	<10.00
29. 1,1,2-Trichloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
30. Tetrachloroethene	<5.00	<5.00	<5.00	<5.00	<5.00
31. 2-Hexanone	<50.00	<50.00	<50.00	<50.00	<50.00
32. Dibromochloromethane	<5.00	<5.00	<5.00	<5.00	<5.00
33. 1,2-Dibromoethane	<5.00	<5.00	<5.00	<5.00	<5.00
34. Chlorobenzene	<5.00	<5.00	<5.00	<5.00	<5.00
35. 1,1,1,2-Tetrachloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
36. Ethylbenzene	<5.00	<5.00	<5.00	<5.00	<5.00
37. Xylenes	<5.00	<5.00	<5.00	<5.00	<5.00
38. Dibromomethane	<10.00	<10.00	<10.00	<10.00	<10.00
39. Styrene	<10.00	<10.00	<10.00	<10.00	<10.00
40. Bromoform	<5.00	<5.00	<5.00	<5.00	<5.00
41. 1,1,2,2-Tetrachloroethane	<5.00	<5.00	<5.00	<5.00	<5.00
42. 1,2,3-Trichloropropane	<15.00	<15.00	<15.00	<15.00	<15.00
43. 1,4-Dichlorobenzene	<5.00	<5.00	<5.00	<5.00	<5.00
44. 1,2-Dichlorobenzene	<5.00	<5.00	<5.00	<5.00	<5.00
45. 1,2-Dibromo-3-Chloropropane	<25.00	<25.00	<25.00	<25.00	<25.00
46. Acrylonitrile	<200.00	<200.00	<200.00	<200.00	<200.00
47. trans-1,4-Dichloro-2-Butene	<100.00	<100.00	<100.00	<100.00	<100.00

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: GREENE CO. LANDFILL
DAVID JONES
P.O. BOX 543
SNOW HILL, NC 28580

CLIENT ID: 6005

ANALYST: MAO
DATE COLLECTED: 09/21/06
DATE ANALYZED: 09/26/06
DATE REPORTED: 10/02/06

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	Well #1R	Equipment Blank	Trip Blank
1. Chloromethane	<10.00	<10.00	<10.00
2. Vinyl Chloride	<10.00	<10.00	<10.00
3. Bromomethane	<10.00	<10.00	<10.00
4. Chloroethane	<10.00	<10.00	<10.00
5. Trichlorofluoromethane	<5.00	<5.00	<5.00
6. 1,1-Dichloroethene	<5.00	<5.00	<5.00
7. Acetone	<100.00	<100.00	<100.00
8. Iodomethane	<10.00	<10.00	<10.00
9. Carbon Disulfide	<100.00	<100.00	<100.00
10. Methylene Chloride	<10.00	<10.00	<10.00
11. trans-1,2-Dichloroethene	<5.00	<5.00	<5.00
12. 1,1-Dichloroethane	<5.00	<5.00	<5.00
13. Vinyl Acetate	<50.00	<50.00	<50.00
14. Cis-1,2-Dichloroethene	<5.00	<5.00	<5.00
15. 2-Butanone	<100.00	<100.00	<100.00
16. Bromochloromethane	<5.00	<5.00	<5.00
17. Chloroform	<5.00	<5.00	<5.00
18. 1,1,1-Trichloroethane	<5.00	<5.00	<5.00
19. Carbon Tetrachloride	<10.00	<10.00	<10.00
20. Benzene	<5.00	<5.00	<5.00
21. 1,2-Dichloroethane	<5.00	<5.00	<5.00
22. Trichloroethene	<5.00	<5.00	<5.00
23. 1,2-Dichloropropane	<5.00	<5.00	<5.00
24. Bromodichloromethane	<5.00	<5.00	<5.00
25. Cis-1,3-Dichloropropene	<10.00	<10.00	<10.00
26. 4-Methyl-2-Pentanone	<100.00	<100.00	<100.00
27. Toluene	<5.00	<5.00	<5.00
28. trans-1,3-Dichloropropene	<10.00	<10.00	<10.00
29. 1,1,2-Trichloroethane	<5.00	<5.00	<5.00
30. Tetrachloroethene	<5.00	<5.00	<5.00
31. 2-Hexanone	<50.00	<50.00	<50.00
32. Dibromochloromethane	<5.00	<5.00	<5.00
33. 1,2-Dibromoethane	<5.00	<5.00	<5.00
34. Chlorobenzene	<5.00	<5.00	<5.00
35. 1,1,1,2-Tetrachloroethane	<5.00	<5.00	<5.00
36. Ethylbenzene	<5.00	<5.00	<5.00
37. Xylenes	<5.00	<5.00	<5.00
38. Dibromomethane	<10.00	<10.00	<10.00
39. Styrene	<10.00	<10.00	<10.00
40. Bromoform	<5.00	<5.00	<5.00
41. 1,1,2,2-Tetrachloroethane	<5.00	<5.00	<5.00
42. 1,2,3-Trichloropropane	<15.00	<15.00	<15.00
43. 1,4-Dichlorobenzene	<5.00	<5.00	<5.00
44. 1,2-Dichlorobenzene	<5.00	<5.00	<5.00
45. 1,2-Dibromo-3-Chloropropane	<25.00	<25.00	<25.00
46. Acrylonitrile	<200.00	<200.00	<200.00
47. trans-1,4-Dichloro-2-Butene	<100.00	<100.00	<100.00

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: 6005 **Week:** 37

GREENE CO. LANDFILL
DAVID JONES
P.O. BOX 543
SNOW HILL NC 28580

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																					
pH CHECK (LAB)																					
CONTAINER TYPE, P/G	P	P	P	P		G	G	G													
CHEMICAL PRESERVATION	A	B	A	A		E	E	E													
PARAMETERS	Field pH	Metals	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2													
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE (mg/l) AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS																
Upstream	09/21/06	1345		17	4	G	G	G	G		G	G									
Downstream	09/21/06	1335		19	4	G	G	G	G		G	G									
Well #4	09/21/06	1325		21	4	G	G	G	G	G	G	G									
Well #5	09/21/06	~~1335~~ 1332		20	4	G	G	G	G	G	G	G									
Well #6	09/21/06	~~1350~~ 1340		20	4	G	G	G	G	G	G	G									
Well #1R	09/21/06	1315		24	5	G	G	G	G	G	G	G	G								
Equipment Blank	09/21/06				3		G				G	G									
Trip Blank					2																

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

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY: Y N

SAMPLES COLLECTED BY: (Please Print) Wayne Fox

SAMPLES RECEIVED IN LAB AT: O. Lee

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

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Wayne Fox	09/21/06 2:23	Anitha Lath	9/21/06 2:23
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

Instructions for completing this form are 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

№ 127229