

RCD 1838

PO 472

4903 .1600 MSW SubDined

01200

Groundwater Sampling Report and Statistical Analysis

Prepared for

Iredell County Subtitle D Landfill, Phase 3
Statesville, North Carolina

July, 2005



MESCO Project Number: G05029.0

Completed on November 1, 2005



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

OPERATION/CONSTRUCTION MANAGERS

Municipal
Services



Engineering
Company, P.A.

CIVIL/SANITARY ENGINEERS

November 1, 2005

Mr. Matt Gamble
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 and Statistical Analysis
Iredell County Subtitle D Landfill, phase 3
MESCO Project No. G05029.0

Dear Mr. Gamble:

Municipal Engineering Company, P.A. (MESCO), sampled the Iredell County Subtitle D Landfill phase 3 area located in Statesville NC for the Appendix I list of metals and volatile organic constituents (VOCs) on July 20 & 25, 2005 as part of the detection monitoring program. Environmental Conservation Laboratories, Inc. (ENCO) of Orlando, FL completed the laboratory analysis of the leachate from the forccemain and the Cary, NC lab completed the remaining analysis. The laboratory results and statistical analysis are included herein.

All detected constituents were analyzed for regulatory exceedance with reference to North Carolina Groundwater Standards. The results are shown in the enclosed table titled "Exceedance Scan". No parameters were detected above the NCGW2L Standard.

Low concentrations of the metals cobalt and lead were detected within shallow compliance well MW-19S. Thallium was also found slightly above the PQL within a water sample obtained from upgradient surface water SW-5. No VOCs were detected during this sampling event with the exception of the leachate sample obtained from the contained forccemain.

All of the monitoring locations outlined in the approved monitoring plan were sampled during this event. Water levels were obtained from several additional piezometers west of the phase 3 area which were installed for the hydrogeologic design study for the proposed phase 4 landfill. These readings were utilized to supplement the water elevations from the monitoring wells to construct a more accurate potentiometric surface.

MESCO completed the enclosed potentiometric map with groundwater elevations on the day of sampling, flow rates and direction. The field data sheet and chain of custody is also enclosed.

The premer statistical analysis as required by the Solid Waste Section has also been completed by MESCO. The purpose of these analyses is to determine, in comparison to background levels, statistical significance of constituents detected from the monitoring well locations for the Subtitle D phase 3 landfill during the July 2005 event.

Statistical Analysis Methodology

Metals

MESCO conducted an interwell statistical analysis on all of the detected metals. Historical data from monitoring well MW-17 were defined as the background wells, 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.

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 cobalt and lead the non-parametric tolerance limit method with 1/2 ND substitution was used because the %ND was between 50% - 90% and the data was not normally distributed.

Intrawell Analyses

Intrawell Analyses were attempted only upon those constituents that were initially found to be statistically significant by interwell analysis. In general, intrawell analysis is conducted in order to differentiate true contamination from spatial variability. Baseline levels in this context are defined as the background level derived from the data in a given downgradient well. Intrawell analyses through Shewhart-CUSUM control charts require a minimum of eight independent historical sampling events and a detection rate greater than 25% (%ND \leq 75%). Due to the sampling event criteria intrawell analysis could not be conducted for this sampling event.

Results

Historical data compiled for monitoring well MW-17 was used as the baseline. Data distributions were reviewed using time series and box and whiskers plots (enclosed charts). Table 2 summarizes those metals that were found statistically significant by interwell comparison analysis.

Table 2. Interwell Analyses Summary

Well	Cobalt
MW-19S	x

x=level significantly higher than the background level

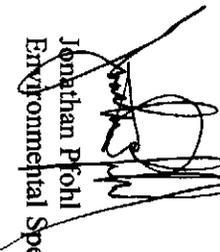
The numbers of metal detections have continuously decreased compared to historical baseline results. The decrease in total metals detected within the samples can likely be attributed to a decrease in turbidity over time through further development of the wells via low flow pumping. Concentrations of cobalt were found to have increased according to interwell analysis within MW-19S. However, intrawell analysis could not be completed for thallium since the formulation of Shewhart-CUSUM charts require a detection rate greater than 25%.

Conclusion

The statistical analysis results conducted on metals indicate no signs of inorganic contamination originating from the Iredell County Subtitle D Landfill phase 3. Although cobalt within MW-19S was found to have increased according to interwell analysis the metal is naturally occurring in the groundwater. Cobalt concentrations within MW-19S have actually decreased to the lowest levels found in that location ever and the pre-operation sampling event conducted on July 17, 2002 yielded the highest concentrations.

The facility will continue detection monitoring and will be sampled for the complete Appendix I list of constituents again in January 2006. If you have any questions regarding this report, please contact me at (919) 772-5393 or by email at jpfohl@mesco.com.

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


Jonathan Pfohl
Environmental Specialist

Enclosures
cc: Mr. David Lambert
Iredell County

Exceedance Scan
Iredell County Subtitle D Landfill, phase 3

Well ID	Parameter Name ¹	Sample Date	Result	Unit	PQL ²	NCGW2L ³	Exceedance
MW-19S	Cobalt	07/20/2005	0.033	mg/L	0.01		
MW-19S	Lead	07/20/2005	0.014	mg/L	0.01	0.015	
SW-5	Thallium	07/25/2005	0.011	mg/L	0.01		
FORCEMAIN	Barium	07/20/2005	0.6	mg/L	0.5		2
FORCEMAIN	Zinc	07/20/2005	0.066	mg/L	0.05		2.1
FORCEMAIN	Phosphorus, Total	07/20/2005	0.72	mg/L	0.03		
FORCEMAIN	Toluene	07/20/2005	8	ug/L	5	1000	
FORCEMAIN	Xylene	07/20/2005	12	ug/L	5	530	
FORCEMAIN	Ethylbenzene	07/20/2005	8	ug/L	5	29	

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
Iredell County Subtitle D Landfill, phase 3

Monitoring Well	Hydraulic Conductivity (cm/sec)	Effective Porosity (%)	Hydraulic Gradient	Flow Rate (ft/yr)	Flow Direction	Water Table Depth (ft)	Water Table Elev. (ft)
MMW-17	3.73E-05	21.70%	0.02	4	S83E	35.31	819.04
MMW-18	7.43E-04	21.70%	0.02	68	S31E	8.43	792.29
MMW-19S	4.54E-04	21.70%	0.02	49	S62E	5.92	787.67
MMW-19D	2.81E-03	21.70%	n/a	n/a	S62E	8.35	787.46
MMW-20	9.50E-04	21.70%	0.02	70	S8E	5.6	790.33
MMW-21S	1.67E-05	21.70%	0.57	45	S82E	34.18	789.79
MMW-21D	9.08E-07	21.70%	n/a	n/a	S82E	31.9	790.86

NOTE: Values for hydraulic conductivity on all wells and piezometers determined via slug test by MESCO
Hydrologic Gradient taken from the July 20, 2005 sampling event.

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

K = hydraulic conductivity

n_e = effective porosity

dh = head difference

dl = horizontal distance

Sampling Data Sheet



Samplers: J. Pfohl

Project: Iredell County Subtitle D Landfill, Phase 3

Water Quality Parameters				Sampling Parameters				Monitoring Point	Sample Date	Sample Time	Depth to Water	Reference Point	Volume Purged	Sample Type	Sampling Depth	pH	Temp.	Specific Cond.	Turbidity	Total Depth
								MW-17	7/20/05	6:45 AM	35.31		7	Pump		7.01	15.9	60	clear	45
								MW-19D		12:10	8.35	26	Pump & filter		6.14	16.0	110	clear	69	
								MW-19S		1:05	5.92	9	Pump		7.01	16.3	130	M. Turb	20	
								MW-21S	7/20/05	6:40 AM	39.18	5	Pump		6.93	15.7	160	clear	41	
								MW-21S	7/20/05	6:40 AM	39.18	5	Pump		6.93	23.6	620	clear	-	
								Force Main	7/20/05	4:10	-	-	floor		5.8	23.6	620	clear	-	
								MW-21D	7/20/05	7:10 AM	31.90	50	Pump & filter		6.97	15.8	110	clear	138.25	
								MW-18		7:50	8.43	7	Pump		6.93	15.9	100	clear	20	
								MW-20		8:20	5.60	8	Pump		7.00	16.2	100	clear	20	
								SM-5		8:35	-	-	Dip		6.9	27.3	60	clear	-	
								P-4	NS		21.10	-	-						-	
								P-5	NS		24.68	-	-						-	
								P-9D	NS		24.36	-	-						-	

Comments

(919) 281-9260
Finkbeiner

Statistical Analyses Summary

**Inter-Well Analyses Summary
Iredell County Subtitle D Landfill, phase 3**

Background Well: (MW-17)

Cobalt, total					
%ND	Normality	Method	ND Adj.	Upper Limit (a = 95%)	Unit
60	-	Non-parametric tolerance interval	1/2 ND	9.6	ug/l
Well	Result	Significance			
MW-19S	33	Yes			

Lead, total					
%ND	Normality	Method	ND Adj.	Upper Limit (a = 95%)	Unit
60	-	Non-parametric tolerance interval	1/2 ND	15	ug/l
Well	Result	Significance			
MW-19S	14	no			

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

Intra-Well Analysis Summary (Metals)
Iredell County Subtitle D Landfill, phase 3

Well	Cobalt
MW-19S	n/a

EXPLANATION

- yes=detection statistically significant by intrawell analysis
- no=detection not statistically significant by intrawell analysis
- n/a=unable to run intrawell analysis due to insufficient sampling events
- Bold=Detected in exceedance of the Standard**

**Unable to determine if metals have statistically increased via
Intra-Well Analysis**

Summary of Pooled VOCs in Background Wells (MW-1A, MW-1B, and MW-1C)
 Iredell County Subtitle D Landfill, phase 3

Constituent	Samples	NDS	% NDS
1,1,1,2-Tetrachloroethane	5	5	100.00
1,1,1-Trichloroethane	5	5	100.00
1,1,2,2-Tetrachloroethane	5	5	100.00
1,1,2-Trichloroethane	5	5	100.00
1,1-Dichloroethane	5	5	100.00
1,1-Dichloroethene	5	5	100.00
1,2,3-Trichloropropane	5	5	100.00
1,2-Dibromo-3-chloropropane	5	5	100.00
1,2-Dibromoethane	5	5	100.00
1,2-Dichlorobenzene	5	5	100.00
1,2-Dichloroethane	5	5	100.00
1,2-Dichloropropane	5	5	100.00
1,4-Dichlorobenzene	5	5	100.00
2-Butanone	5	5	100.00
2-Hexanone	5	5	100.00
4-Methyl-2-Pentanone	5	5	100.00
Acetone	5	5	100.00
Acrylonitrile	5	5	100.00
Benzene	5	5	100.00
Bromochloromethane	5	5	100.00
Bromodichloromethane	5	5	100.00
Bromoforn	5	5	100.00
Bromomethane	5	5	100.00
Carbon disulfide	5	5	100.00
Carbon tetrachloride	5	5	100.00
Chlorobenzene	5	5	100.00
Chlorodibromomethane	5	5	100.00
Chloroethane	5	5	100.00
Chloroforn	5	5	100.00
Chloromethane	5	5	100.00
cis-1,2-Dichloroethene	5	5	100.00
cis-1,3-Dichloropropane	5	5	100.00
Dibromomethane	5	5	100.00
Dichloromethane	5	5	100.00
Ethylbenzene	5	5	100.00
Iodomethane	5	5	100.00
Styrene	5	5	100.00
Tetrachloroethylene	5	5	100.00
Toluene	5	5	100.00
trans-1,2-Dichloroethene	5	5	100.00
trans-1,3-Dichloropropane	5	5	100.00
trans-1,4-Dichloro-2-butene	5	5	100.00
Trichloroethylene	5	5	100.00
Trichlorofluoromethane	5	5	100.00
Vinyl acetate	5	5	100.00
Vinyl chloride	5	5	100.00
Xylene	5	5	100.00
Total	235	235	100.00

Poisson Prediction Interval Based upon Pooled Background VOCs
Iredell County Subtitle D Landfill, phase 3

All detected VOCs (Background Well: MW-17)

Constituent

NONE

Detection(s) per Scan 0.00

Total number of sampling events [n] = 5

Total number of detections in background wells [y] = 0

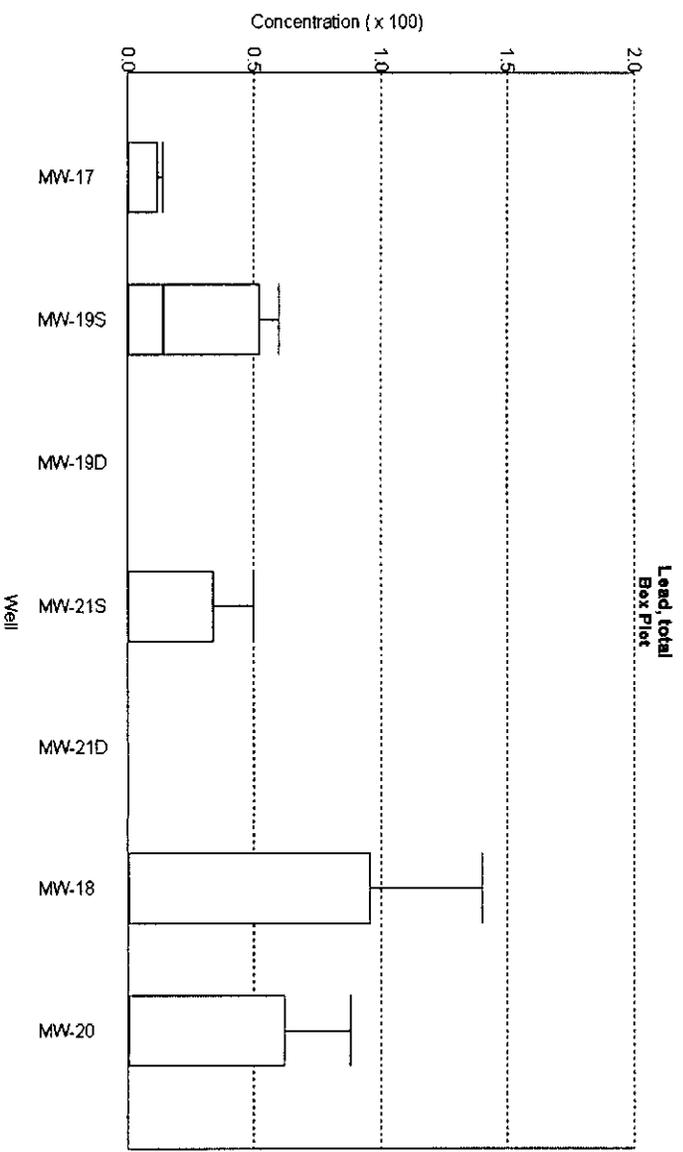
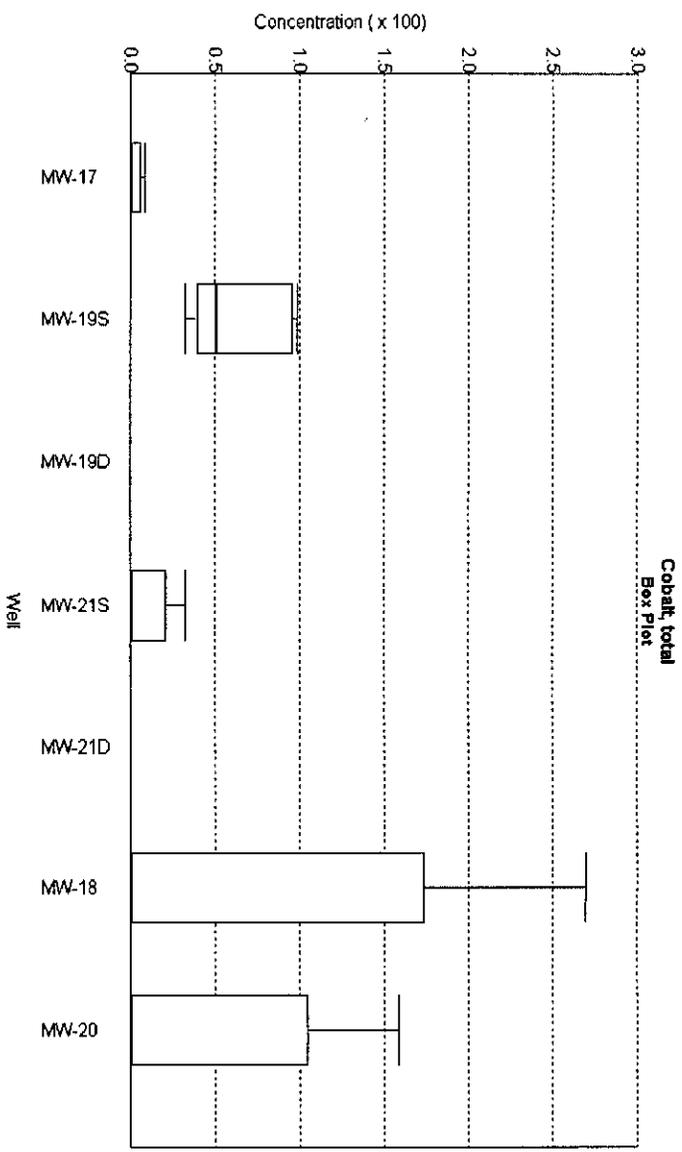
Number of comparisons (downgradient wells) [k] = 6

One-sided value of Student's t-statistic (95% confidence) [t] = 4.38

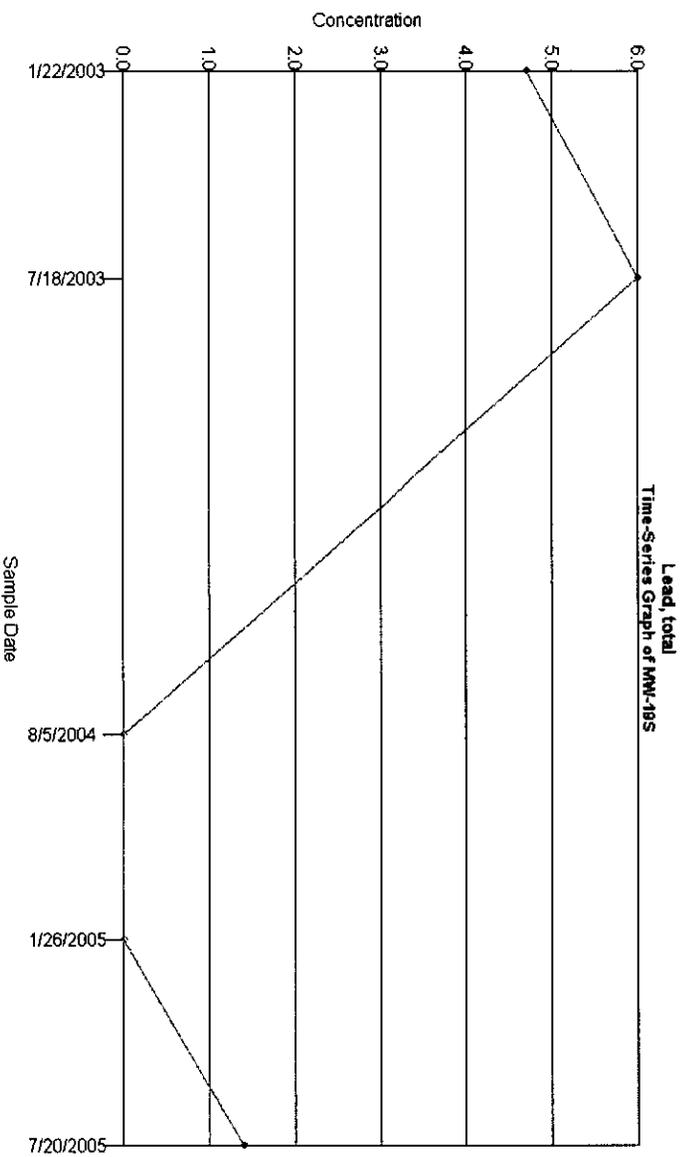
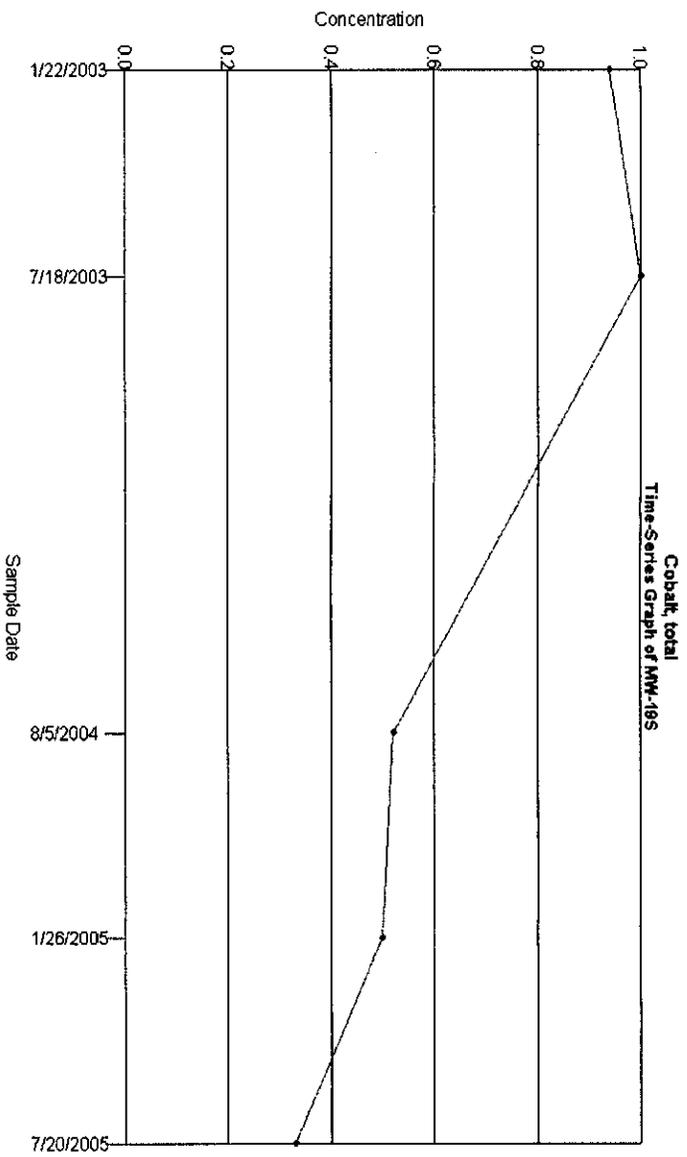
Expected number of detections in a single future sample [V'] = 3.83

NO Statistically significant VOC detections at 95% confidence level

**Box Plots for Select Constituents
Iredell County Subtitle D Landfill, phase 3**

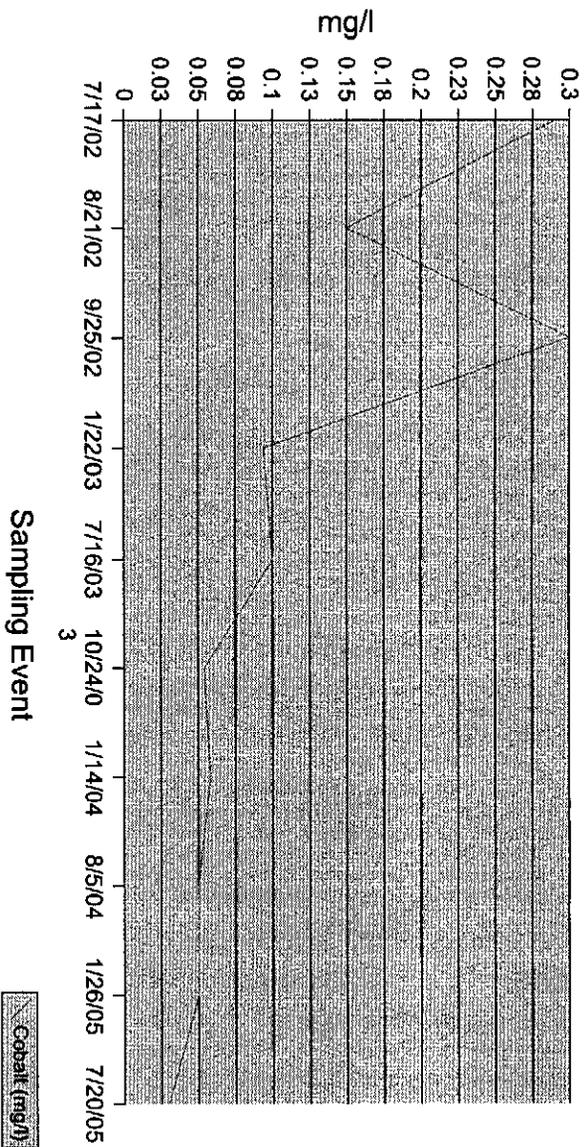


**Time Series Plots for Select Constituents
Iredell County Subtitle D Landfill, phase 3**



Time Series Plots for Select Constituents
 Iredell County Subtitle D Landfill, phase 3

MW-19S



Cobalt (mg/l)	7/17/02	8/21/02	9/25/02	1/22/03	7/16/03	10/24/03	1/14/04	8/5/04	1/26/05	7/20/05
Type	Baler	Baler	Baler	Baler	Baler	Baler	Pump	Pump	Pump	Pump

7/17/02 event pre-operation baseline

Basic Statistics

Basic Statistics

Parameter: Lead, total

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

Total Observations	
35	
Total Non-Detects	24
Pooled Mean	18.3457
Pooled Std Dev	29.4404
Background Mean	7.82
Background Std Dev	4.38885

Background Wells

There is 1 background well

Well	Samples	Non-Detects% ND	Total	Rank Sum	Rank Mean
MW-17	5	60	39.1		
Well	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-17	7.82	4.38885	0	89.5	17.9

Compliance Wells

There are 6 compliance wells

Well	Samples	Non-Detects% ND	Total	Rank Sum	Rank Mean	
MW-19D	5	100	20			
MW-19S	5	40	131			
MW-21S	5	60	85			
MW-21D	5	100	20			
MW-18	5	60	208			
MW-20	5	60	139			
Well	Mean	Std Dev	Dif From Bk	Std Err	Rank Sum	Rank Mean
MW-19D	4	1.36931	-3.82	18.2791	62.5	12.5
MW-19S	26.2	25.6066	18.38	18.2791	114	22.8
MW-21S	17	19.9499	9.18	18.2791	96.5	19.3
MW-21D	4	1.36931	-3.82	18.2791	62.5	12.5
MW-18	41.6	58.8031	33.78	18.2791	104.5	20.9
MW-20	27.8	36.2312	19.98	18.2791	100.5	20.1

Analysis of Variance Statistics

SS Wells	6080.18
SS Total	29469

Kruskal-Wallis Statistics

Non-Detect Rank	12.5
Background Rank Sum	89.5
Background Rank Mean	17.9
H Statistic	4.66952
H Adjusted for Ties	6.88851

Interwell Analyses for Metals

Non-Parametric Tolerance Interval

Parameter: Cobalt, total

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 30%

Background Samples (n) = 5

Maximum Background Concentration = 9.6

Minimum Coverage = 54.9%

Average Coverage = 83.33333%

Well	Sample	Result	Impacted
MW-19S	1/22/2003	94	TRUE
MW-19S	7/18/2003	100	TRUE
MW-19S	8/5/2004	52	TRUE
MW-19S	1/26/2005	50	TRUE
MW-19S	7/20/2005	33	TRUE

Non-Parametric Tolerance Interval

Parameter: Lead, total

Original Data (Not Transformed)

Non-Detects Replaced with 1/2 DL

Total Percent Non-Detects = 50%

Background Samples (n) = 5

Maximum Background Concentration = 15

Minimum Coverage = 54.9%

Average Coverage = 83.33333%

Well	Sample	Result	Impacted
MW-19S	1/22/2003	47	TRUE
MW-19S	7/18/2003	60	TRUE
MW-19S	8/5/2004	ND<5	FALSE
MW-19S	1/26/2005	ND<5	FALSE
MW-19S	7/20/2005	14	FALSE

Laboratory Results



ENVIRONMENTAL CONSERVATION LABORATORIES

QSARF # *F12-70*
CARY

4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
Ph. (904) 296-3007 • Fax (904) 296-6210

10207 General Drive
Orlando, Florida 32824-8529
Ph. (407) 826-5314 • Fax (407) 850-6945

1015 Passport Way
Cary, North Carolina 27513
Ph. (919) 677-1669 • Fax (919) 677-9846

ENCO CompQAP No.: 960038G/0

CHAIN OF CUSTODY RECORD

PROJECT REFERENCE IRDEL CO. SUB. D LF, PH 1&2					PROJECT NO. G05013.0		P.O. NUMBER		MATRIX TYPE										REQUIRED ANALYSIS						PAGE		OF								
PROJECT LOC. (State) NC		SAMPLER(S) NAME J. Pfohl			PHONE (919)-772-5393		FAX (919)-772-1176		SURFACE WATER GROUND WATER WASTEWATER DRINKING WATER SOIL/SOLID/SEDIMENT NONAQUEOUS LIQUID (oil, solvent, etc.) AIR SLUDGE OTHER <i>Leachate</i> NO. API Metals 3200-API PVC BOD NITRATE/NO2/NITRATES/SS COD/PHOSPHORUS/AS/AT <i>PH</i>										<input checked="" type="checkbox"/> STANDARD REPORT DELIVERY <input type="checkbox"/> EXPEDITED REPORT DELIVERY (surcharge) Date Due: _____						REMARKS										
CLIENT NAME Municipal Engineering Services					CLIENT PROJECT MANAGER Mr. Jonathan Pfohl																						PRESERVATIVE						NUMBER OF CONTAINERS SUBMITTED		
CLIENT ADDRESS (CITY, STATE, ZIP) 1140 Benson Road Garner, NC 27529					SAMPLE IDENTIFICATION																														
SAMPLE																																			
STATION	DATE	TIME	GRAB	COMP.	SAMPLE IDENTIFICATION																														
1	7/20/05	4:00	X		LAGOON																														
2	7/20/05	4:10	X		FORCEMAIN																														
3																																			
4																																			
5																																			
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			
13																																			
14																																			
SAMPLE KIT PREPARED BY: C JACKSONVILLE O ORLANDO					DATE	TIME	RELINQUISHED BY: (SIGNATURE)					DATE	TIME	RECEIVED BY: (SIGNATURE)					DATE	TIME															
					7/21/05	12:28	<i>Amy Arnebeck</i>																												
RELINQUISHED BY: (SIGNATURE)					DATE	TIME	RECEIVED BY: (SIGNATURE)					DATE	TIME	RELINQUISHED BY: (SIGNATURE)					DATE	TIME															
<i>J. Pfohl (Mesa)</i>					7/20/05	5:00																													
RECEIVED BY: (SIGNATURE)					DATE	TIME	RELINQUISHED BY: (SIGNATURE)					DATE	TIME	RECEIVED BY: (SIGNATURE)					DATE	TIME															
RECEIVED FOR LABORATORY BY: (SIGNATURE)					DATE	TIME	CUSTODY INTACT	ENCO LOG NO.	REMARKS									DATE	TIME																
<i>D. Wuemmel</i>					7/21/05	9:00	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	0037981	PLEASE REPORT the 2 samples separately. LAGOON = Irredell Co. sub. D LF, PH 1&2																										



ENVIRONMENTAL CONSERVATION LABORATORIES

4810 Executive Park Court, Suite 211
 Jacksonville, Florida 32216-6069
 Ph. (904) 296-3007 • Fax (904) 296-6210

10207 General Drive
 Orlando, Florida 32824-8529
 Ph. (407) 826-5314 • Fax (407) 850-6945

1015 Passport Way
 Cary, North Carolina 27513
 Ph. (919) 677-1669 • Fax (919) 677-9846

ENCO CompQAP No.: 960038G/0

CHAIN OF CUSTODY RECORD

PROJECT REFERENCE Irdell Co. Subtitle D LF, Phase 3					PROJECT NO. G05013.0(B)					P.O. NUMBER					MATRIX TYPE					REQUIRED ANALYSIS					PAGE / OF /	
PROJECT LOC. (State) NC		SAMPLER(S) NAME J. Pfohl			PHONE (919)-772-5393					FAX (919)-772-1176					SURFACE WATER GROUND WATER WASTEWATER DRINKING WATER SOIL/SOLID/SEDIMENT NONAQUEOUS LIQUID (oil, solvents, etc.) AIR SLUDGE OTHER NC AP1 METALS SD AP1 NC					<input checked="" type="checkbox"/> STANDARD REPORT DELIVERY <input type="checkbox"/> EXPEDITED REPORT DELIVERY (surcharge) Date Due: _____						
CLIENT NAME Municipal Engineering Services					CLIENT PROJECT MANAGER Mr. Jonathan Pfol																					
CLIENT ADDRESS (CITY, STATE, ZIP) 1140 Benson Road Garner, NC 27529																										
SAMPLE																										
STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION					PRESERVATIVE					NUMBER OF CONTAINERS SUBMITTED					REMARKS						
1	7/25/05	6:40	X		(MS/MSD) MW-215										3											
2		7:10			MW-21D										3											
3		7:50			MW-18										3											
4		8:20			MW-20										3											
5		8:35			SW-5										3											
6					MW-										3											
7					MW-										3											
8					MW-										3											
9					MW-										3											
10					MW-										3											
11					MW-										3											
12					MW-24S(MS/MSD)										6											
13																										
14																										
SAMPLE KIT PREPARED BY: <input type="checkbox"/> JACKSONVILLE <input type="checkbox"/> ORLANDO <input checked="" type="checkbox"/> CARY				DATE	TIME	RELINQUISHED BY: (SIGNATURE)					DATE	TIME	RECEIVED BY: (SIGNATURE)					DATE	TIME							
				7/17/05	13:20	Amy Chaschew																				
RELINQUISHED BY: (SIGNATURE)				DATE	TIME	RECEIVED BY: (SIGNATURE)					DATE	TIME	RELINQUISHED BY: (SIGNATURE)					DATE	TIME							
RECEIVED BY: (SIGNATURE)				DATE	TIME	RELINQUISHED BY: (SIGNATURE)					DATE	TIME	RECEIVED BY: (SIGNATURE)					DATE	TIME							
													Amy Chaschew					7/25/05	10:00							
RECEIVED FOR LABORATORY BY: (SIGNATURE)			DATE	TIME	CUSTODY INTACT	ENCO LOG NO.	REMARKS																			
CARY			7/25/05	10:48	YES	CARY8343	Combine Results w/previous Phase 3 samples previously submitted when Reporting.																			



ENVIRONMENTAL CONSERVATION LABORATORIES

QSART #

4810 Executive Park Court, Suite 211
 Jacksonville, Florida 32216-6069
 Ph. (904) 296-3007 • Fax (904) 296-6210

10207 General Drive
 Orlando, Florida 32824-8529
 Ph. (407) 826-5314 • Fax (407) 850-6945

1015 Passport Way
 Cary, North Carolina 27513
 Ph. (919) 677-1669 • Fax (919) 677-9846

ENCO CompQAP No.: 960038G/0

CHAIN OF CUSTODY RECORD

PROJECT REFERENCE <i>Idel Co. Sub. DLF, Ph 3</i>				PROJECT NO.		P.O. NUMBER		MATRIX TYPE				REQUIRED ANALYSIS				PAGE 1	OF 1
PROJECT LOC. (State) <i>NC</i>		SAMPLER(S) NAME <i>J. Pfohl</i>		PHONE <i>(919) 772-5393</i>		FAX <i>(919) 772-1176</i>		SURFACE WATER GROUND WATER WASTEWATER DRINKING WATER SOIL/SOLID/SEDIMENT NONAQUEOUS LIQUID (oil, solvent, etc.) AIR SLUDGE OTHER <i>NC Air 3 Metals</i> <i>8200 Air Vols</i>				<input checked="" type="checkbox"/> STANDARD REPORT DELIVERY <input type="checkbox"/> EXPEDITED REPORT DELIVERY (surcharge) Date Due: _____					
CLIENT NAME <i>Municipal Engineering Services</i>				CLIENT PROJECT MANAGER <i>J. Pfohl</i>													
CLIENT ADDRESS (CITY, STATE, ZIP) <i>1140 Benson Hwy Ste 220 Garner NC 27529</i>																	
SAMPLE								PRESERVATIVE				NUMBER OF CONTAINERS SUBMITTED				REMARKS	
STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION												
1	7/20/05	6:45 AM	X		MW-17			X				1 3					
2	↓	12:10	↓		MW-19D			↓				↓					
3	↓	1:05	↓		MW-19S			↓				↓					
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
SAMPLE KIT PREPARED BY:				DATE	TIME	RELINQUISHED BY: (SIGNATURE)				DATE	TIME	RECEIVED BY: (SIGNATURE)				DATE	TIME
<input type="checkbox"/> JACKSONVILLE <input type="checkbox"/> ORLANDO																	
RELINQUISHED BY: (SIGNATURE)				DATE	TIME	RECEIVED BY: (SIGNATURE)				DATE	TIME	RELINQUISHED BY: (SIGNATURE)				DATE	TIME
RECEIVED BY: (SIGNATURE)				DATE	TIME	RELINQUISHED BY: (SIGNATURE)				DATE	TIME	RECEIVED BY: (SIGNATURE)				DATE	TIME
<i>Amy Arachene</i>				<i>7/22/05</i>	<i>14:30</i>												
RECEIVED FOR LABORATORY BY: (SIGNATURE)				DATE	TIME	CUSTODY INTACT	ENCO LOG NO.	REMARKS									
<i>[Signature]</i>				<i>7/22/05</i>	<i>15:23</i>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	<i>CP418343</i>	<i>Partial sample submittal Remainder to be delivered later. Must Report together in one report</i>									