Prepared for:

Coble's Sandrock, Inc.
5833 Foster Store Road
Liberty, North Carolina 27298

JEI Project No. 00419.1000.12, Task No. 01

FIRST SEMIANNUAL GROUNDWATER MONITORING REPORT OF 2010 & ALTERNATE SOURCE DEMONSTRATION – IRON AND MANGANESE

COBLE'S SANDROCK CONSTRUCTION & DEMOLITION DEBRIS LANDFILL
ALAMANCE COUNTY, NORTH CAROLINA
PERMIT NO. 01-05

August 2010

Prepared by:

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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):

Joyce Engineering, Inc.

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

Name: Jeremey J. Kerly Phone: (336) 323-0092

E-mail: jkerly@joyceengineering.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Coble's Sandrock, Inc. C&D Debris Landfill	5833 Foster Store Road Liberty, NC 27928	01-05	.0500	April 26-27, 2010 June 15, 2010

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☐ Assessment Monitoring ☐ Corrective Action

Type of data submitted: (Check all that apply)

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

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Jeremey J. Kerly — Facility Representative Name (Print)
Project Consultant — Title
(336) 323-0092 — (Area Code) Telephone Number

Signature — Date: 8-5-10

Affix NC Licensed/Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 2097 GEOLOGIST JEREMEY JOHN KERLY

2211 West Meadowview Road, Suite 101 Greensboro, NC 27407
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NC PE Firm License Number (if applicable effective May 1, 2009)

Revised 6/2009

First Semiannual Groundwater Monitoring Report of 2010 &
Alternate Source Demonstration – Iron and Manganese
Coble's Sandrock Construction & Demolition Debris Landfill
Alamance County, North Carolina

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1.0 INTRODUCTION

1.1 Site Information

The Coble's Sandrock Construction and Demolition (C&D) Debris Landfill is owned and operated by the Kent and Brenda Coble under Permit No. 01-05. The property consists of approximately 154 acres in Alamance County, one half mile east of Kimesville, North Carolina and approximately eight miles south of Burlington, North Carolina. The 154 acres includes the currently permitted 39.6 acres plus an adjacent expansion area of 114.4 acres. The current C & D facility has been in operation since 1998 on the currently permitted 39.6 acres previously approved for site suitability. It includes a total of 12.86 acres approved for waste disposal, including Phase 1 (7.0 acres), Phase 2A (1.1 acres), and Phase 2B (4.76 acres). The proposed 114.4 acre expansion property is contiguous with and south and east of the currently permitted facility, and includes two proposed new waste cells, Phase 3A (6.3 acres) and Phase 3B (5.6 acres).

The site is located in the Piedmont physiographic province on a group of knolls and valleys. The northeast-flowing Poppaw Creek is located along the northern facility property line. Two primary drainages (small, intermittent creeks) transect the site and flow into Poppaw Creek. One of the drainages flows west-southwest across the southern half of the site and has a 2- to 4-acre man-made pond at its upstream limit in the southeastern corner of the proposed site. The other drainage flows north-northwest, roughly parallel to the eastern site boundary, and is fed by outflow from a small pond located on the site property and by two smaller, spring-fed drainages which flow into it from off the site property to east. These streams and ponds are shown on Drawing No. 1. Adjoining land uses are primarily agricultural and residential. The regional topography is shown on an excerpt of the USGS 7.5 Minute Topographic Quadrangle for Kimesville, North Carolina included as Figure No. 1.

1.2 Site Geology

The site is located within the Carolina Slate Belt in the central Piedmont physiographic and geological province. The Carolina Slate Belt consists of metamorphosed sediments, volcanics, and intrusive igneous rocks and the site is underlain by a felsic intrusive complex. The complex is described as white to gray, fine- to coarse-grained, massive to foliated, metamorphosed bodies of assemblages of intimately associated felsic intrusive rock types. The rock types vary from granite, granodiorite, quartz diorite, to quartz monzonite. Narrow mafic dikes are common within the felsic intrusive units. This region is also characterized by regional- and small-scale Mesozoic diabase dikes. Most of the dikes are near-vertical and trend north-south to northwest-southeast and are characterized by plagioclase, augite and olivine minerals (Ragland, 1991).

The rock seen in float and/or large outcrops, as well as rock core from this site was predominantly medium-grained biotite-muscovite granite with foliation observed locally. Otherwise, site outcrops of granite are massive, with very little to no observed structure or

foliation. No diabase dikes have been observed at the site, but numerous mafic (meta-volcanic) dikes do exist.

1.3 Regulatory Status

The Coble's Sandrock C&D Debris Landfill is currently in the detection monitoring program for C&D landfills under Section .0544 of the North Carolina Solid Waste Management Rules. The facility initially monitored for the eight RCRA metals and NC Appendix I list of volatile organic compounds. After the Permit to Operate was issued on February 23, 2009 for Phases 1 and 2, Continued Operation, the full list of NC Appendix I constituents including mercury, chloride, manganese, sulfate, iron, alkalinity, and total dissolved solids were sampled beginning with the April 2010 event.

2.0 FACILITY MONITORING PROGRAM

2.1 Groundwater Monitoring Program

Seven active groundwater monitoring wells comprise the monitoring network at the Coble's Sandrock C&D Debris Landfill. The current compliance network consists of the following monitoring wells: MW-2, MW-4, MW-6 (facility background well), MW-7, MW-8, MW-10S, and PZ-19S. Monitoring wells MW-5 and MW-10D are monitored for water levels only.

Monitoring Well	Date Installed	Classification	Monitoring Program	Total Depth from TOC (ft)	Lithology of Screened Interval
MW-1	3/25/97	-	Abandoned	35.85	Saprolite/Part. Weathered Rock
MW-2	3/28/97	Compliance	Detection	22.98	Saprolite/Part. Weathered Rock
MW-3	3/31/97	-	Abandoned	59.82	Bedrock
MW-4	4/01/97	Compliance	Detection	24.22	Saprolite/Part. Weathered Rock
MW-5	1/18/02	Observation	Water Level	17.20	Saprolite/Part. Weathered Rock
MW-6	8/05/97	Background	Detection	41.00	Bedrock
MW-7	12/19/02	Compliance	Detection	16.00	Saprolite/Part. Weathered Rock
MW-8	3/21/05	Compliance	Detection	22.76	Saprolite/Part. Weathered Rock
MW-9	3/21/05	-	Abandoned	40.16	Partially Weathered Rock
MW-10S	3/22/05	Compliance	Detection	24.34	Bedrock
MW-10D	3/25/05	Observation	Water Level	66.86	Bedrock
PZ-19S	1/31/02	Compliance	Detection	13.00	Saprolite

Three monitoring wells (MW-1, MW-2, and MW-4) were installed during the Phase 1 site suitability study to characterize the uppermost aquifer. A letter dated September 18, 1998 from Trigon Engineering Consultants, Inc. to the Solid Waste Section stated that piezometer P-1 was converted to an upgradient monitoring well now known as MW-3. After April 2003, MW-3 was replaced with MW-6 (formerly P-3) as the upgradient background well. PZ-19S was installed originally as a piezometer for the new Phase 3 Expansion in January 2002 but has been since converted to a monitoring well for future compliance monitoring. Well MW-5 was added to the compliance network before the April 2002 sampling event, but was replaced with MW-7 before the November 2003 sampling event at the request of the Solid Waste Section. Four monitoring wells (MW-8, MW-9, MW-10S, and MW-10D) were installed in and around the Phase 3A waste

cell limits between March 21 and 25, 2005. Monitoring wells, MW-1, MW-3, and MW-9, were abandoned on September 30 and 31, 2008 for the Phase 3A and 3B expansion.

2.2 Surface Water Monitoring Program

Surface water monitoring at the Coble's Sandrock C&D Debris Landfill is completed in accordance with NCSWMR §0602 (Surface Water Monitoring) and the approved Water Quality Monitoring Plan for the facility.

Surface Point	Classification	Monitoring Program
SW-1	Compliance	Surface Water
SW-2	Compliance	Surface Water

The two surface water monitoring points are monitored semiannually for the full list of NC Appendix I constituents including mercury, chloride, manganese, sulfate, iron, alkalinity, and total dissolved solids. Surface water point SW-1 monitors water quality in Poppaw Creek, shortly after it enters the site. The sample location is at the property line near the northwest edge of the site. Surface water monitoring point SW-2 serves as a downstream monitoring point. Samples from this point are collected at a location approximately 350 feet northeast of the proposed Phase 3 disposal area near the northeastern corner of the site and where a small tributary that flows adjacent to the eastern property boundary discharges into Poppaw Creek. Surface water monitoring point locations are shown on Drawing No. 1.

3.0 FIRST SEMIANNUAL SAMPLING EVENT OF 2010

3.1 Field Work and Visual Inspection

In order to detect potential releases of leachate and/or landfill gas migration in a timely manner, a visual inspection program has been implemented at the Coble's Sandrock C&D Debris Landfill. This inspection program involves field personnel making the following observations:

- Observation of stress induced on the biological community (i.e., dead or dying vegetation),
- Indications of leachate impact (i.e., seeps, impacted surface water),
- Observations of erosion; and
- Negative changes around the waste facility.

On April 26-27, 2010 personnel from JEI visited Coble's Sandrock C&D Debris Landfill to purge and sample monitoring wells MW-2, MW-4, MW-6, MW-7, MW-8, MW-10S, and P-19S. Surface monitoring points SW-1 and SW-2 were also sampled during the April 2010 event. Beginning with the background well (MW-6), depth-to-water measurement were obtained to the nearest 0.01 foot using an electronic water level indicator for all monitoring wells in the compliance network prior to purging.

On June 15, 2010 personnel from JEI visited Coble's Sandrock C&D Debris Landfill to purge and resample monitoring wells MW-2, MW-4, and MW-7. Four soil samples were also collected from the subsurface via hand auger.

Monitoring wells were purged and sampled using disposable bailers. Measurements of temperature, pH, specific conductivity, and turbidity were recorded in the dedicated site log book prior to purging, after each purge volume, and during sampling. Prior to sampling, laboratory-supplied containers were prepared with the following information:

- Monitoring well number (completed by field personnel),
- Date and time of sample collection (completed by field personnel),
- Initials of sampling personnel (completed by field personnel),
- Project name and number (completed by the laboratory),
- Chemical preservative (completed by the laboratory); and
- Requested chemical analysis (completed by the laboratory).

Groundwater samples from each monitoring well were collected directly from the disposable bailers in the provided laboratory containers either immediately after purging or within 24 hours of the final purge volume. Immediately after collection, the samples were placed on ice in a laboratory provided cooler. Field data logs are provided in Appendix 1.

3.2 Laboratory Analysis and JEI Quality Control

The April 2010 groundwater and surface water samples and the June 2010 groundwater and soil samples were submitted to Pace Analytical Services, Inc. of Huntersville, North Carolina under chain-of-custody control for analysis. As presented earlier, the April 2010 groundwater samples were analyzed for the full list of NC Appendix I constituents including mercury, chloride, manganese, sulfate, iron, alkalinity, and total dissolved solids. The June 2010 groundwater and soil samples were analyzed for chromium, iron, and manganese, and groundwater samples were also analyzed for TDS. JEI requested a Level II data report for each final laboratory report. The samples were received by the laboratory on April 28, 2010 and June 15, 2010 in good condition, properly preserved, and within analyses hold times.

In addition to samples collected for compliance monitoring at the Coble's Sandrock C&D Debris Landfill, a Field Blank was collected by JEI personnel as part of the April 2010 sampling and June 2010 resampling events. Also, a Trip Blank was prepared by the laboratory to accompany the volatile sampling containers to and from the laboratory for the April 2010 sampling event. The April 2010 Field Blank was analyzed the full list of NC Appendix I constituents including mercury, chloride, manganese, sulfate, iron, alkalinity, and total dissolved solids while the Trip Blank was analyzed for NC Appendix I volatile organic compounds only. The June 2010 Field Blank was analyzed for chromium, iron, and manganese only.

Upon receipt of the laboratory data packages, the data was reviewed by JEI personnel for the following:

- General typographical errors,
- Correct analyses performed and within method specified hold times,
- Biased data results based on Surrogate Recoveries, Matrix Spike, Matrix Spike Duplicate, and Laboratory Control Samples,
- Blank qualified data (B-flags),
- Detections above the NC 2L Groundwater Standards (NC 2L), Groundwater Water Protection Standards (GWPS), and/or NC 2B Surface Water Standards (NC 2B); and
- Detections that are above historical levels.

4.0 HYDROGEOLOGICAL CONDITIONS

The surficial aquifer beneath the site occurs within saprolite, partially weathered rock (PWR), and bedrock. Generally, the saprolite and PWR units are relatively thin (5 to 40 feet) at and around the waste disposal areas. The saprolite and PWR are expected to behave as a relatively isotropic, porous medium, whereas groundwater flow in the bedrock is primarily through fractures; however, the bedrock is highly fractured and well connected to the overlying units so they are expected to behave as a single aquifer. The groundwater potentiometric surface, based on water level measurements taken on April 26-27, 2010, is shown on Drawing No. 1.

Horizontal hydraulic gradients for the site were calculated using three groundwater flow line segments indicated on the groundwater surface contour map (Drawing No. 1). Average linear groundwater flow velocities were calculated using the modified Darcy equation:

$$\mathbf{V = Ki/n}$$

where **V** = average linear velocity (feet per day), **K** = hydraulic conductivity (ft/day), **i** = horizontal hydraulic gradient, and **n** = effective porosity. An effective porosity of **n** = 0.21 (21%) was assumed based on average effective porosities for saprolite and PWR determined by laboratory analysis of soil samples. The average gradients (**i**) were determined for each flow path shown on Drawing No. 1. The geometric mean of the hydraulic conductivities of all slug test conducted on the site (**K** = 1.97×10^{-1} ft/day) was used for groundwater flow calculations for the site.

The above equation makes the simplifying assumptions of a homogeneous, isotropic aquifer in a porous medium. Groundwater flow velocities were calculated using saprolite and PWR data because the site's uppermost aquifer is primarily in those hydrogeologic units. An average linear groundwater flow velocity was calculated across areas where bedrock is the surficial aquifer because rock cores have shown that bedrock is highly fractured to the point that groundwater flow is expected to behave relatively similar to the unconsolidated hydrogeologic units. Also, aquifer tests conducted on bedrock wells and piezometers showed similar range of values for hydraulic conductivity. Groundwater flow velocities within the fractured bedrock aquifer are likely to be variable.

Data and calculations for the horizontal gradients are presented in Table 2. The calculated horizontal gradients from three flow line segments across the site range from 0.023 to 0.066 ft/ft. Calculated linear groundwater velocities ranged from approximately 0.022 to 0.062 ft/day.

5.0 DATA ANALYSIS

Results from the April 26-27, 2010 sampling event were received May 17, 2010 from Pace Analytical Services, Inc. and are found in Appendix 1. Groundwater resampling and soil analyses results from the June 15, 2010 event were received June 30, 2010 from Pace Analytical Services, Inc. and are also found in Appendix 1.

5.1 Statistical Methods

The background data for inorganic and organic constituents were evaluated using the Shapiro-Wilk Test, Parametric Prediction Limits, Parametric Tolerance Intervals, Aitchison's Adjustment, Non-Parametric Prediction Limits, and Poisson Prediction Limits as appropriate. Background data, tests for normality, outliers, Aitchison's adjustment, tolerance interval, or prediction limits are used, as appropriate based on the background data. The statistical test by which downgradient data are compared to facility background data is based upon the nature of the data and the number of data values that are less than the laboratory limit of detection. All statistical tests are evaluated at the 0.05 level of significance, 95% confidence level, and are conducted as one-tailed tests.

5.2 Statistical Results

Statistical background values were calculated using data from historical semiannual sampling events at the facility through this event. A summary of the April 2010 statistical background calculations are provided in the following table. Detailed statistical analysis worksheets can be found in Appendix 2. The data set from well MW-6 (current background well) in addition to background monitoring event data from MW-8, MW-10S, and PZ-19S were evaluated to determine the appropriate procedure for calculation of the background value for each parameter.

Constituent	Data Distribution	Statistical Method used to Establish Background	Background Concentration	Noted Increases
Barium	Log Normal	Parametric Tolerance Interval	3,653	None
Chromium	Log Normal	Parametric Tolerance Interval	42.5	None
Cobalt	Non-Normal	Non-Parametric Prediction Interval	32.8	None
Iron	Log Normal	Parametric Tolerance Interval	195,561	None
Manganese	Log Normal	Parametric Tolerance Interval	2,117	MW-7
Zinc	Non-Normal	Non-Parametric Prediction Interval	161	None

1. Concentrations are in micrograms per liter (µg/L)
2. N/A = Not Applicable

Background concentrations for inorganic constituents were determined using statistical procedures as discussed in **Section 5.1**. One SSI was confirmed (manganese) in groundwater during the April 2010 sampling and June 2010 resampling events.

5.3 Analytical Results for Groundwater and Comparisons to Standards

The following inorganic and organic constituents were detected in groundwater during the April 2010 sampling and June 2010 resampling events. All concentrations are reported in micrograms per liter (µg/L). Concentrations with a "J" are considered to be estimated. Concentrations with a "B" are attributed to lab or field contamination. Highlighted concentrations were detected above their respective NC 2L or GWPS.

Constituent	NC 2L/ GWPS	Background	Downgradient						Blanks
		MW-6	MW-2	MW-4	MW-7	MW-8	MW-10S	P-19S	
Arsenic	10	ND	ND	ND	5.8 J	ND	ND	ND	ND
Barium	700	42.1 B	54.9 B	111 B	333	74.9 B	62.0 B	79.7 B	27.2 J
Beryllium	4	0.32 J	0.38 J	0.16 J	ND	0.21 J	0.13 J	ND	ND
Chromium	10	0.41 J	14.2	1.9 J	4.3 J	4.6 J	7.6 J	0.46 J	ND
Chromium (Resample)	10	NS	4.0 J	NS	NS	NS	NS	NS	ND
Cobalt	70	ND	ND	1.4 J	25.6	3.4 J	ND	4.4 J	ND
Copper	1,000	ND	9.4 J	ND	ND	1.4 J	8.0 J	1.1 J	ND
Iron	300	242 J	10,900	642	11,300	11,000	2,940	1,070	15.8 J
Iron (Resample)	300	NS	2,910	887	13,000	NS	NS	NS	26.5 J
Manganese	50	9.4 B	99.6	750	18,600	137	347	793	4.8 J
Manganese(Resample)	50	NS	29.3 B	914	19,900	NS	NS	NS	7.4 J
Nickel	100	ND	11.7 J	ND	ND	2.5 J	3.5 J	ND	ND
Silver	20	ND	0.20 J	0.57 J	1.5 J	ND	ND	ND	ND
Thallium	0.28	ND	4.5 B	4.6 B	6.6 B	ND	ND	ND	ND
Vanadium	3.5	0.55 B	19.6 J	1.6 B	3.1 J	12.2 J	8.5 J	3.0 J	0.48 J
Zinc	1,000	ND	23.2	ND	ND	19.9	1.6 J	ND	ND
Acetone	6,000	ND	ND	5.6 J	3.7 J	3.1 J	4.3 J	5.1 J	ND
Benzene	1	ND	ND	0.86 J	0.69 J	ND	ND	ND	ND
1,4-Dichlorobenzene	6	ND	ND	0.46 J	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethylene	70	ND	ND	ND	0.28 J	ND	ND	ND	ND
4-Methyl-2-pentanone	560	ND	ND	ND	0.41 J	ND	ND	ND	ND
Alkalinity	NE	8,200B	18,700B	72,600B	868,000	61,500B	51,200B	24,600B	20,500
TDS	500,000	114,000B	160,000B	568,000	1,550,000	112,000B	180,000B	110,000B	60,000
TDS (Resample)	500,000	NS	NS	696,000	1,560,000	NS	NS	NS	ND
Chloride	250,000	7,900B	ND	51,100	127,000	ND	17,500B	12,600B	8,000
Sulfate	NE	ND	11,800B	262,000	301,000	ND	29,300B	24,000B	10,600

1. ND = Not detected above laboratory detection limits.
2. NE = Not established.

In general, the inorganic and organic results are consistent with historical data. Historical groundwater data can be found in Table 3. Chromium was detected above the NC 2L in monitoring well MW-2 during the April 2010 sampling event. The June 2010 resampling event did <u>not</u> confirm the exceedence. Iron and manganese were detected above their respective NC 2L standards in all downgradient monitoring wells. The June 2010 resampling event confirmed exceedences in MW-2, MW-4, and MW-7, with the exception of manganese in MW-2. Monitoring wells MW-8, MW-10S, and PZ-19S were not resampled since prior historical data

has been considered background and the April 2010 detects were all below well-specific historical levels as indicated in Table 3.

5.4 Analytical Results for Surface Water and Comparisons to Standards

The following inorganic and organic constituents were detected in surface water during the April 2010 sampling event. All concentrations are reported in micrograms per liter (µg/L). Concentrations with a "J" are considered to be estimated. Concentrations with a "B" are attributed to lab or field contamination. Highlighted concentrations were detected above their respective NC 2B standards.

Constituent	NC 2B	SW-1	SW-2	Blanks
Barium	NE	24.5 B	61.8 B	27.2 J
Beryllium	6.5	0.28 J	0.11 J	ND
Chromium	50	ND	0.93 J	ND
Cobalt	NE	1.8 J	1.8 J	ND
Copper	7	1.4 J	ND	ND
Iron	1,000	1,480	717	15.8 J
Manganese	NE	378	653	4.8 J
Silver	0.06	0.38 J	ND	ND
Vanadium	NE	2.0 J	ND	ND
Alkalinity	NE	38,900 B	61,500 B	20,500
Total Dissolved Solids	NE	88,000B	18,200B	60,000
Chloride	230,000	7,200 B	8,100 B	8,000
Sulfate	NE	7,800 B	23,600 B	10,600

1. ND = Not detected above laboratory detection limits.
2. NE = Not established.

Historical surface water data can be found in Table 4. Iron was detected above its respective NC 2B standard in SW-1; however, SW-1 is located where Poppaw Creek enters the site. In addition, elevated concentrations of iron in surface waters appear to be naturally occurring due to the concentrations of iron in local soils.

5.5 Analytical Results for Soils – Alternate Source Demonstration Soil Analyses

The following inorganic constituents were detected in soil samples collected during the June 2010 resampling event. All concentrations are reported in milligrams per kilogram (mg/kg). Concentrations with a "J" are considered to be estimated.

Constituent	SS-1 (Upgradient)	SS-2 (MW-2)	SS-3 (MW-4)	SS-4 (MW-7)	Blanks
Sample Depth (ft)	**9**	**9**	**6**	**5**	
Chromium	2.5	4.1	NS	NS	ND
Iron	7,320	12,700	28,300	12,600	6.6
Manganese	22.1	149	226	33.3	0.054 J

1. ND = Not detected above laboratory detection limits.
2. NS = Not sampled.

As expected, based on the analytical results indicated above, iron and manganese are present in soils both up and down gradient of the landfill.

6.0 CONCLUSIONS

6.1 Alternate Source Demonstration – Iron and Manganese

Upon review of the April 2010 laboratory analytical data, it was determined that iron and manganese concentrations reported in the groundwater sample collected from monitoring wells MW-2, MW-4, MW-7, MW-8, MW-10S, and PZ-19S exceeded their respective NC 2L standards. Manganese detected in MW-7 was the only concentration considered to be a statistically significant increase (SSI) above the calculated background. The current NC 2L standard for iron is 300 micrograms per liter (µg/L) while the calculated background concentration is 195,561 µg/L. The current NC 2L standard for manganese is 50 µg/L while the calculated background concentration is 2,117 µg/L.

A resampling event was performed by JEI on June 15, 2010 for monitoring wells MW-2, MW-4, and MW-7 only. Groundwater samples were not collected from MW-8, MW-10S, and PZ-19S since previous monitoring events were considered background monitoring events and the April 2010 detections were below historical levels for each well. Resampling results were received on June 30, 2010 and confirmed the detections of iron and manganese in monitoring wells MW-2, MW-4, and MW-7, with the exception of manganese in MW-2 as this detection was blank qualified.

In conjunction with the resampling event performed on June 15, 2010, soil samples were collected in the vicinity of monitoring wells MW-2, MW-4, and MW-7 in addition to one upgradient sample collected. The results were received on June 22, 2010 and indicated the presence of iron and manganese in native soils.

Based on historical site conditions, statistical analyses, and soil analyses, JEI has concluded that the source of iron and manganese present throughout the site is not from landfill leachate impact. This conclusion is based on the following observations:

- The concentrations of iron detected in downgradient compliance monitoring wells are not considered to be statistically significant increases (SSI) over the calculated background level of 195,561 µg/L.

- The concentrations of manganese detected in downgradient compliance monitoring wells are not considered to be statistically significant increases (SSI) over the calculated background level of 2,117 µg/L, with the exception of MW-7. Manganese detected in monitoring well MW-7 could be the result of elevated concentrations present in the surrounding soils and parent rock. No pre-waste conditions or historical data are present for manganese at this location. Continued evaluation of manganese in monitoring well MW-7 is recommended as historical data is compiled.

- Soil samples collected from the vicinity of monitoring wells MW-2, MW-4, and MW-7, including a location upgradient of the landfill indicate quantified

concentration of iron and manganese in the native soils. Concentrations of iron and manganese indicate fluctuations in native soils but this is to be expected at different locations and elevations. Considering the concentration levels detected in soils at each monitoring well location, it is not surprising to see elevated concentrations in the groundwater.

- Historical data for organic and inorganic constituents indicate no exceedences of NC 2L or GWPS across the facility monitoring network. Chromium has, at times, been detected above it respective NC 2L standard in monitoring well MW-2; however, when resampled, concentrations dropped below regulatory limits. In addition, June 2010 soil samples indicated the presence of chromium in the native soils upgradient of the landfill and in the vicinity of monitoring well MW-2.

- Indicator parameters such as alkalinity, total dissolved solids (TDS), chloride, and sulfate have shown quantified concentrations in downgradient monitoring wells. Concentrations of TDS in monitoring wells MW-4 and MW-7 were detected above the NC 2L; however, this is to be expected with much higher concentrations of iron and manganese detected in groundwater at these locations. At this time, considering there are no regulatory exceedences for NC Appendix I constituents, iron and manganese are naturally occurring, and little historical indicator parameter data are available, continued evaluation of indicator parameters is recommended.

In conclusion, JEI finds no evidence that the NC 2L exceedences of iron and manganese are a result of leachate impact from the landfill. JEI believes that both iron and beryllium are naturally occurring in soils and parent rock across the site, based on recent soil analyses. JEI recommends that the site remain in the Detection Monitoring Program for C&D landfills with continued evaluation of indicator parameters. Coble's Sandrock, Inc. requests that future exceedences and SSI's of iron and manganese will not require the facility to proceed with an ASD as defined by Title 15A, Chapter 13, Subchapter 13B, Section .0545, (b) (8).

6.2 First Semiannual Compliance Monitoring of 2010

There were no organic constituents detected above the NC 2L or GWPS during the April 2010 sampling event. Chromium was detected in MW-2 above the NC 2L during the April 2010 sampling event but was <u>not</u> confirmed by the June 2010 resampling event. Other than iron and manganese, which are addressed in **Section 6.1**, no other inorganic constituents were confirmed detections above NC 2L and GWMP. Based on the analytical results from the April 2010 sampling and June 2010 resampling event and a successful ASD for iron and manganese, Coble's Sandrock C&D Debris Landfill will remain in the Detection Monitoring Program for C&D landfills. The next semiannual monitoring event is scheduled for October 2010.

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Tables

Table 1 Summary of Groundwater Elevations
Table 2 Summary of Horizontal Hydraulic Gradients and Linear Velocities
Table 3 Summary of Historical Groundwater Constituents
Table 4 Summary of Historical Surface Water Constituents

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS

Location	Background	Downgradient											
	MW-6	MW-1	MW-2	MW-3	MW-4	MW-5	MW-7	MW-8	MW-9	MW-10S	MW-10D	PZ-19S	PZ-19D
TOC Elevation	652.56	602.46	582.31	613.05	582.64	577.41	583.33	574.26	589.09	592.46	592.76	572.18	571.85
Well Depth	41.00	35.85	22.98	59.82	24.22	17.20	16.00	22.76	40.16	24.34	66.86	13.00	62.20
Apr-00	NA	569.59	569.81	579.91	569.07	NI	NI	NI	NI	NI	NI	NI	NI
Aug-00	627.42	568.21	566.97	578.23	568.08	NI	NI	NI	NI	NI	NI	NI	NI
Oct-00	NA	569.30	568.55	578.25	568.81	NI	NI	NI	NI	NI	NI	NI	NI
Nov-00	627.30	568.09	566.87	577.47	567.04	NI	NI	NI	NI	NI	NI	NI	NI
Apr-01	627.17	571.48	569.72	578.67	569.06	NI	NI	NI	NI	NI	NI	NI	NI
Dec-01	621.78	567.28	565.31	575.90	566.21	NI	NI	NI	NI	NI	NI	NI	NI
Apr-02	623.94	568.17	567.84	576.09	568.21	569.32	NI	NI	NI	NI	NI	NI	NI
Nov-02	626.32	570.60	570.36	578.47	569.74	570.45	NI	NI	NI	NI	NI	NI	NI
Apr-03	633.40	571.66	569.18	579.70	568.84	570.32	574.38	NI	NI	NI	NI	567.41	567.38
Nov-03	632.53	568.49	567.38	578.54	567.47	569.59	572.44	NI	NI	NI	NI	566.78	567.01
Apr-04	630.13	568.54	568.44	578.92	567.83	569.86	573.63	NI	NI	NI	NI	567.04	567.19
Oct-04	628.60	567.86	567.92	577.61	567.91	570.30	573.30	NI	NI	NI	NI	567.15	567.14
Apr-05	630.65	568.90	568.69	578.54	568.16	570.76	574.54	NS	NS	NS	NS	567.19	567.45
Oct-05	625.65	567.16	565.52	576.33	566.43	569.12	571.24	NS	NS	NS	NS	565.66	565.45
27-Apr-06	624.46	567.84	569.36	NS	569.34	NS	572.77	NS	NS	NS	NS	568.10	567.55
11-Oct-06	624.45	567.91	567.22	577.59	568.29	570.11	571.77	567.03	567.92	583.95	583.62	NS	NS
16-Apr-07	629.42	570.33	570.04	NS	569.38	571.49	574.94	569.10	569.76	584.80	585.37	NS	NS
11-Oct-07	624.91	566.74	563.35	NS	564.43	NS	570.18	NS	NS	580.07	580.28	NS	NS
15-Apr-08	625.12	569.67	569.41	NS	568.87	569.99	574.03	568.85	569.57	584.34	584.73	NS	NS
15-Oct-08	625.86	AB	568.11	AB	569.00	570.33	573.64	564.91	AB	NS	NS	NS	NS
18-Mar-09	NS	AB	NS	AB	NS	NS	NS	569.89	AB	585.42	NS	567.97	NS
21-Apr-09	629.77	AB	569.89	AB	569.21	NS	575.52	569.14	AB	585.07	NS	567.90	NS
21-May-09	NS	AB	NS	AB	NS	NS	NS	567.96	AB	584.17	NS	567.28	NS
08-Oct-09	626.40	AB	564.24	AB	565.47	NS	571.25	565.47	AB	582.81	NS	564.00	NS
26-Apr-10	631.51	AB	578.23	AB	568.27	570.13	574.57	567.94	AB	584.10	584.16	567.22	567.00

Notes:
1. Water levels are measured from top of casing (TOC).
2. NS = Not sampled and/or water levels not measured.
3. AB = Monitoring well has been abandoned.
4. NI = Monitoring well has not been installed.
5. NA = Data not available.

TABLE 2

SUMMARY OF HORIZONTAL HYDRAULIC GRADIENTS AND LINEAR VELOCITIES

GRADIENT CALCULATION SEGMENT	FLOW LINE LENGTH (feet)	FLOW DIRECTION	GROUNDWATER ELEVATION (feet)	HORIZONTAL GRADIENT i (ft/ft)	HYDRAULIC CONDUCTIVITY K (ft/day)	EFFECTIVE POROSITY n	LINEAR VELOCITY V (ft/day)
i_1	1295	NW	630 / 600	0.023	1.97E-01	0.21	0.022
i_2	422	N	590 / 570	0.047	1.97E-01	0.21	0.044
i_3	303	W	590 / 570	0.066	1.97E-01	0.21	0.062
			Average:	0.046		Average:	0.043

NOTES:

1. The hydraulic conductivity (**K**) is taken from the geometric mean of **K** estimated from slug tests performed during hydrogeologic investigations.
2. The effective porosity (**n**) is taken from the average **n** determined by laboratory analysis of soil samples.
3. The horizontal hydraulic gradient (**i**) is the change in groundwater elevation divided by the segment length.
4. The groundwater flow velocity (**V**) is calculated based on the modified Darcy equation: **V=Ki/n**.

TABLE 3

SUMMARY OF HISTORICAL GROUNDWATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)																																	
		DL	RL	Background		Downgradient																													Blanks	
				MW-6		MW-1		MW-2		MW-3		MW-4		MW-5		MW-7		MW-8		MW-10S		P-19S														
Antimony	19-Mar-09	2.6	6.0	NS		AB		NS		AB		NS		NS		NS		3.1	J	ND		ND													ND	
	22-Apr-09	2.6	6.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND													ND	
	14-May-09	2.6	6.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND													ND	
	8-Oct-09	2.6	6.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND													ND	
GWPS = 1.4 µg/L (01/01/10)	27-Apr-10	2.6	6.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND													ND	
Arsenic	Apr-00	8	10	NA		ND		ND		10	J	ND		NI		NI		NI		NI		NI													ND	
	Nov-00	NR	10	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI													ND	
	Apr-01	NR	10	Wl		ND		ND		ND		ND		NI		NI		NI		NI		NI													ND	
	Dec-01	NR	10	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI													ND	
	Apr-02	NR	10	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL													ND	
	Nov-02	NR	10	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL													ND	
	Apr-03	NR	10	WL		ND		ND		ND		ND		ND		WL		NI		NI		WL													ND	
	Nov-03	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL													ND	
	Apr-04	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL													ND	
	Oct-04	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL													ND	
	Apr-05	NR	10	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL													ND	
	Oct-05	NR	10	ND		NS		ND		WL		ND		WL		ND		WL		WL		WL													ND	
	28-Apr-06	NR	10	ND		ND		ND		NS		ND		NS		ND		WL		WL		WL													ND	
	11-Oct-06	NR	10	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL													ND	
	19-Apr-07	2.0	10	ND		ND		ND		NS		2.0	B	WL		ND		WL		WL		WL													2.1	J
	11-Oct-07	3.0	10	ND		NS		ND		NS		ND		NS		ND		WL		WL		WL													ND	
NC 2L = 50 µg/L (10/23/07)	15-Apr-08	2.7	10.0	ND		ND		ND		NS		ND		WL		ND		WL		WL		WL													ND	
	15-Oct-08	2.7	10.0	ND		AB		ND		AB		ND		WL		ND		WL		WL		WL													ND	
	19-Mar-09	2.7	10.0	NS		AB		NS		AB		NS		NS		NS		4.8	J	3.1	J	ND													ND	
	22-Apr-09	2.7	10.0	ND		AB		ND		AB		ND		NS		11.4		ND		ND		ND													ND	
	14-May-09	2.7	10.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND													ND	
	08-Oct-09	2.7	10.0	ND		AB		2.9	J	AB		ND		NS		11.0		ND		ND		ND													ND	
NC 2L = 10 µg/L (01/01/10)	27-Apr-10	2.7	10.0	ND		AB		ND		AB		ND		NS		5.8	J	ND		ND		ND													ND	
Barium	Apr-00	2	8	NA		240		180		340		ND		NI		NI		NI		NI		NI													ND	
	Nov-00	NR	500	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI													ND	
	Apr-01	NR	500	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI													ND	
	Dec-01	NR	500	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI													ND	
	Apr-02	NR	500	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL													ND	
	Nov-02	NR	500	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL													ND	
	Apr-03	NR	500	WL		ND		ND		ND		ND		ND		WL		NI		NI		WL													ND	
	Nov-03	NR	500	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL													ND	
	Apr-04	NR	500	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL													ND	
	Oct-04	NR	500	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL													ND	
	Apr-05	NR	500	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL													ND	
	Oct-05	NR	500	ND		NS		ND		WL		ND		WL		ND		WL		WL		WL													ND	
	28-Apr-06	NR	500	ND		ND		ND		NS		ND		NS		ND		WL		WL		WL													ND	
	11-Oct-06	NR	500	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL													ND	
	19-Apr-07	0.20	100	58.8	J	19.4	J	66.0	J	NS		24.9	J	WL		140		WL		WL		WL													0.30	J
	11-Oct-07	2.0	100	38.2	B	NS		478		NS		45.8	B	NS		241		WL		WL		WL													35.8	J
NC 2L = 2,000 µg/L (10/23/07)	15-Apr-08	0.20	100	37.8	J	19.9	J	44.0	J	NS		31.3	J	WL		156		WL		WL		WL													ND	
	15-Oct-08	0.20	100	41.3	J	AB		73.8	J	AB		19.9	J	WL		175		WL		WL		WL													ND	
	19-Mar-09	0.20	100	NS		AB		NS		AB		NS		NS		NS		357		59.0	J	62.4	J												11.5	J
	22-Apr-09	0.20	100	46.4	B	AB		48.3	B	AB		19.8	B	NS		300		95.0	J	56.5	B	63.2	B												13.4 (13.8)	J
	14-May-09	0.20	100	NS		AB		NS		AB		NS		NS		NS		101		49.1	B	74.1													12.5	J
	08-Oct-09	0.20	100	39.7	B	AB		77.9	B	AB		106		NS		259		120		85.5	J	113													18.5 (15.4)	J
NC 2L = 700 µg/L (01/01/10)	27-Apr-10	0.20	100	42.1	B	AB		54.9	B	AB		111	B	NS		333		74.9	B	62.0	B	79.7	B												27.2	J
Beryllium	19-Mar-09	0.10	1.0	NS		AB		NS		AB		NS		NS		NS		1.3		0.13	J	ND													ND	
GWPS = 4 µg/L (10/23/07)	22-Apr-09	0.10	1.0	ND		AB		ND		AB		ND		NS		ND		0.20	J	ND		ND													ND	
	14-May-09	0.10	1.0	NS		AB		NS		AB		NS		NS		NS		0.21		ND		ND													ND	
	08-Oct-09	0.10	1.0	ND		AB		ND		AB		ND		NS		ND		0.48	B	0.23	B	ND													0.1	J
	27-Apr-10	0.10	1.0	0.32	J	AB		0.38	J	AB		0.16	J	NS		ND		0.21	J	0.13	J	ND													ND	

TABLE 3

SUMMARY OF HISTORICAL GROUNDWATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)																											
		DL	RL	Background		Downgradient																						Blanks	
				MW-6		MW-1		MW-2		MW-3		MW-4		MW-5		MW-7		MW-8		MW-10S		P-19S			
Cadmium	Apr-00	1	4	NA		2	J	2	J	4		ND		NI		NI		NI		NI		NI		ND	
	Nov-00	NR	1	WL		2		ND		ND		ND		NI		NI		NI		NI		NI		ND	
	Apr-01	NR	1	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI		ND	
	Dec-01	NR	1	WL		3.5		1.0		ND		ND		NI		NI		NI		NI		NI		ND	
	Apr-02	NR	1	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL		ND	
	Nov-02	NR	1	WL		1.3		ND		ND		1.2		1.0		NI		NI		NI		WL		ND	
	Apr-03	NR	1	WL		2.0		1.4		1.9		1.7		2.6		WL		NI		NI		WL		ND	
	Nov-03	NR	1	ND		3.2		1.1		WL		1.4		WL		ND		NI		NI		WL		ND	
	Apr-04	NR	1	1.8		ND		1.7		WL		ND		WL		ND		NI		NI		WL		ND	
	Oct-04	NR	1	1		ND		ND		WL		ND		WL		ND		NI		NI		WL		ND	
	Apr-05	NR	1	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL		ND	
	Oct-05	NR	1	ND		NS		ND		WL		ND		WL		ND		WL		WL		WL		ND	
	28-Apr-06	NR	1	ND		ND		ND		NS		ND		NS		ND		WL		WL		WL		ND	
	11-Oct-06	NR	1.00	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL		ND	
	19-Apr-07	0.50	1	ND		ND		ND		NS		ND		WL		ND		WL		WL		WL		ND	
	11-Oct-07	0.1	1	ND		NS		0.4	J	NS		ND		NS		ND		WL		WL		WL		ND	
NC 2L = 1.75 µg/L (10/23/07)	15-Apr-08	0.50	1.0	ND		ND		ND		NS		ND		WL		ND		WL		WL		WL		ND	
	15-Oct-08	0.50	1.0	ND		AB		ND		AB		ND		WL		ND		WL		WL		WL		ND	
	19-Mar-09	0.50	1.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND		ND	
	22-Apr-09	0.50	1.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND		ND	
	14-May-09	0.50	1.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND		ND	
	08-Oct-09	0.50	1.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND		ND	
NC 2L = 2 µg/L (01/01/10)	27-Apr-10	0.50	1.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND		ND	
Chromium	Apr-00	3	12	NA		36		30		76		10	J	NI		NI		NI		NI		NI		ND	
	Nov-00	NR	10	WL		15		ND		ND		ND		NI		NI		NI		NI		NI		ND	
	Apr-01	NR	10	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI		ND	
	Dec-01	NR	10	WL		31		10		ND		ND		NI		NI		NI		NI		NI		ND	
	Apr-02	NR	10	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL		45	
	Nov-02	NR	10	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL		ND	
	Apr-03	NR	10	WL		ND		ND		ND		ND		ND		WL		NI		NI		WL		ND	
	Nov-03	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL		ND	
	Apr-04	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL		ND	
	Oct-04	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL		ND	
	Apr-05	NR	10	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL		ND	
	Oct-05	NR	10	ND		NS		14		WL		ND		WL		ND		WL		WL		WL		ND	
	28-Apr-06	NR	10	ND		ND		ND		NS		ND		NS		ND		WL		WL		WL		ND	
	11-Oct-06	NR	10.0	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL		ND	
	19-Apr-07	2.0	10	ND		ND		10.9		NS		3.8	J	WL		ND		WL		WL		WL		ND	
	11-Oct-07	1.0	10	1.7	J	NS		121		NS		5.8	J	NS		12.7		WL		WL		WL		ND	
Resample	28-Dec-07	1.0	10	NS		NS		15.7		NS		NS		NS		NS		WL		WL		WL		ND	
NC 2L = 50 µg/L (10/23/07)	15-Apr-08	0.40	10.0	1.5	B	2.1	B	11.1		NS		7.7	J	WL		0.47	B	WL		WL		WL		0.61	J
	15-Oct-08	0.40	10.0	1.6	J	AB		15.3		AB		1.3	J	WL		1.8	J	WL		WL		WL		ND	
	19-Mar-09	0.40	10.0	NS		AB		NS		AB		NS		NS		NS		25.0		14.3		0.57	B	0.54	J
	22-Apr-09	0.40	10.0	0.53	J	AB		10.3		AB		2.6	J	NS		1.6	J	6.5	J	10.2		ND		ND	
	14-May-09	0.40	10.0	NS		AB		NS		AB		NS		NS		NS		6.3	J	7.6	J	ND		ND	
	08-Oct-09	0.40	10.0	0.41	J	AB		16.5		AB		0.71	J	NS		10.5		8.6	J	25.1		0.45	J	ND	
NC 2L = 10 µg/L (01/01/10)	27-Apr-10	0.40	10.0	0.41	J	AB		14.2		AB		1.9	J	NS		4.3	J	4.9	J	7.6	J	0.46	J	ND	
Resample	15-Jun-10	0.40	10.0	NS		AB		4.0	J	AB		NS		NS		NS		NS		NS		NS		ND	
Cobalt	19-Mar-09	0.60	10.0	NS		AB		NS		AB		NS		NS		NS		32.8		4.5	B	9.9	B	0.54	J
GWPS = 70 µg/L (10/23/07)	22-Apr-09	0.60	10.0	NS		AB		NS		AB		NS		NS		NS		9.7	B	1.8	B	10.4	B	ND	
	14-May-09	0.60	10.0	NS		AB		NS		AB		NS		NS		NS		11.1	B	4.8	B	10.3	B	ND	
	08-Oct-09	0.60	10.0	NS		AB		NS		AB		NS		NS		NS		6.1	J	6.8	J	5.9	J	ND	
	27-Apr-10	0.60	10.0	ND		AB		ND		AB		1.4	J	NS		25.6		3.4	J	ND		4.4	J	ND	
Copper	19-Mar-09	0.30	10.0	NS		AB		NS		AB		NS		NS		NS		9.1	J	15.6		ND		ND	
NC 2L = 1,000 µg/L (10/23/07)	22-Apr-09	0.30	10.0	NS		AB		NS		AB		NS		NS		NS		2.1	B	15.3	B	0.52	B	0.78	J
	14-May-09	0.30	10.0	NS		AB		NS		AB		NS		NS		NS		1.9	J	11.8		ND		ND	
	08-Oct-09	0.30	10.0	NS		AB		NS		AB		NS		NS		NS		2.4	J	27.8		0.44	J	ND	
	27-Apr-10	0.30	10.0	ND		AB		9.4	J	AB		ND		NS		ND		1.4	J	8.0	J	1.1	J	ND	
Iron	19-Mar-09	14.0	300	NS		AB		NS		AB		NS		NS		NS		54500		4810		3150		21.6	J
	22-Apr-09	14.0	300	NS		AB		NS		AB		NS		NS		NS		14600		3470		4130		ND	
	14-May-09	14.0	300	NS		AB		NS		AB		NS		NS		NS		15600		2680		2020		ND	
	08-Oct-09	14.0	300	NS		AB		NS		AB		NS		NS		NS		19400		9670		8060		ND	
NC 2L = 300 µg/L (01/01/10)	27-Apr-10	14.0	300	242	J	AB		10900		AB		642		NS		11300		11000		2940		1070		15.8	J
Resample	15-Jun-10	14.0	300	NS		AB		2910		AB		887		NS		13000		NS		NS		NS		26.5	J

TABLE 3

SUMMARY OF HISTORICAL GROUNDWATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)																											
		DL	RL	Background		Downgradient																						Blanks	
				MW-6		MW-1		MW-2		MW-3		MW-4		MW-5		MW-7		MW-8		MW-10S		P-19S							
Lead	Apr-00	3	12	NA		5	J	5	J	19		ND		NI		NI		NI		NI		NI						ND	
	Nov-00	NR	10	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI						ND	
	Apr-01	NR	10	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI						ND	
	Dec-01	NR	10	WL		11		ND		ND		ND		NI		NI		NI		NI		NI						ND	
	Apr-02	NR	10	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL						ND	
	Nov-02	NR	10	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL						ND	
	Apr-03	NR	10	WL		ND		ND		ND		ND		ND		WL		NI		NI		WL						ND	
	Nov-03	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL						ND	
	Apr-04	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL						ND	
	Oct-04	NR	10	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL						ND	
	Apr-05	NR	10	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL						ND	
	Oct-05	NR	10	ND		NS		ND		WL		ND		WL		ND		WL		WL		WL						ND	
	28-Apr-06	NR	10	ND		ND		ND		NS		ND		NS		ND		WL		WL		WL						ND	
	11-Oct-06	NR	10.0	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL						ND	
	19-Apr-07	2.0	10	ND		ND		ND		NS		ND		WL		ND		WL		WL		WL						ND	
	11-Oct-07	6.0	10	ND		NS		ND		NS		ND		NS		ND		WL		WL		WL						ND	
NC 2L = 15 µg/L (10/23/07)	15-Apr-08	4.0	10.0	ND		ND		ND		NS		ND		WL		ND		WL		WL		WL						ND	
	15-Oct-08	4.0	10.0	ND		AB		ND		AB		ND		WL		ND		WL		WL		WL						ND	
	19-Mar-09	4.0	10.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND						ND	
	22-Apr-09	4.0	10.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND						ND	
	14-May-09	4.0	10.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND						ND	
	08-Oct-09	4.0	10.0	ND		AB		ND		AB		ND		NS		6.9	J	ND		ND		ND						ND	
	27-Apr-10	4.0	10.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND						ND	
Manganese	19-Mar-09	0.30	50.0	NS		AB		NS		AB		NS		NS		NS		830		359		1280						5.2	J
	22-Apr-09	0.30	50.0	NS		AB		NS		AB		NS		NS		NS		188		553		850						4.7	J
	14-May-09	0.30	50.0	NS		AB		NS		AB		NS		NS		NS		196		640		819						4.0	J
	08-Oct-09	0.30	50.0	NS		AB		NS		AB		NS		NS		NS		236		1050		1890						6.4	J
NC 2L = 50 µg/L (01/01/10)	27-Apr-10	0.30	50.0	9.4	B	AB		99.6		AB		750		NS		18600	D	137		347		793						4.8	J
Resample	15-Jun-10	0.30	50.0	NS		AB		29.3	B	AB		914		NS		19900	D	NS		NS		NS						7.4	J
Mercury	19-Mar-09	0.070	0.20	NS		AB		NS		AB		NS		NS		NS		0.10	B	0.098	B	0.070						0.086	J
NC 2L = 1.05 µg/L (10/23/07)	22-Apr-09	0.070	0.20	ND		AB		ND		AB		ND		NS		0.12	J	ND		ND		ND						ND	
	14-May-09	0.070	0.20	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND						ND	
	08-Oct-09	0.070	0.20	ND		AB		ND		AB		ND		NS		0.25		0.075	J	ND		ND						ND	
NC 2L = 1 µg/L (01/01/10)	27-Apr-10	0.070	0.20	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND						ND	
Nickel	19-Mar-09	1.7	50.0	NS		AB		NS		AB		NS		NS		NS		25.0		8.2	B	2.0	B					1.8	J
NC 2L = 100 µg/L (10/23/07)	22-Apr-09	1.7	50.0	ND		AB		NS		AB		NS		NS		NS		6.6	B	6.3	B	ND						1.8	J
	14-May-09	1.7	50.0	NS		AB		NS		AB		NS		NS		NS		6.1	J	4.8	J	ND						ND	
	08-Oct-09	1.7	50.0	ND		AB		NS		AB		NS		NS		NS		9.0	J	13.8	J	2.2	J					ND	
	27-Apr-10	1.7	50.0	ND		AB		11.7	J	AB		ND		NS		ND		2.5	J	3.5	J	ND						ND	
Selenium	Apr-00	4	16	NA		ND		ND		13	J	ND		NI		NI		NI		NI		NI						ND	
	Nov-00	NR	20	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI						ND	
	Apr-01	NR	20	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI						ND	
	Dec-01	NR	20	WL		ND		ND		ND		ND		NI		NI		NI		NI		NI						ND	
	Apr-02	NR	20	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL						ND	
	Nov-02	NR	20	WL		ND		ND		ND		ND		ND		NI		NI		NI		WL						ND	
	Apr-03	NR	20	WL		ND		ND		ND		ND		ND		WL		NI		NI		WL						ND	
	Nov-03	NR	20	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL						ND	
	Apr-04	NR	20	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL						ND	
	Oct-04	NR	20	ND		ND		ND		WL		ND		WL		ND		NI		NI		WL						ND	
	Apr-05	NR	20	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL						ND	
	Oct-05	NR	20	ND		NS		ND		WL		ND		WL		ND		WL		WL		WL						ND	
	28-Apr-06	NR	20	ND		ND		ND		NS		ND		NS		ND		WL		WL		WL						ND	
	11-Oct-06	NR	20.0	ND		ND		ND		WL		ND		WL		ND		WL		WL		WL						ND	
	19-Apr-07	2.0	10	2.3	B	ND		ND		NS		ND		WL		ND		WL		WL		WL						3.5	J
	11-Oct-07	2.0	10	ND		NS		ND		NS		ND		NS		ND		WL		WL		WL						ND	
NC 2L = 50 µg/L (10/23/07)	15-Apr-08	3.8	10.0	ND		ND		ND		NS		ND		WL		5.1	J	WL		WL		WL						ND	
	15-Oct-08	3.8	10.0	ND		AB		4.4	B	AB		ND		WL		ND		WL		WL		WL						5.6	J
	19-Mar-09	3.8	10.0	NS		AB		NS		AB		NS		NS		NS		5.4	J	ND		ND						ND	
	22-Apr-09	3.8	10.0	ND		AB		ND		AB		ND		NS		5.1	J	ND		ND		ND						ND	
	14-May-09	3.8	10.0	NS		AB		NS		AB		NS		NS		NS		ND		ND		ND						ND	
	08-Oct-09	3.8	10.0	ND		AB		ND		AB		ND		NS		7.0	J	ND		ND		ND						ND	
NC 2L = 20 µg/L (01/01/10)	27-Apr-10	3.8	10.0	ND		AB		ND		AB		ND		NS		ND		ND		ND		ND						ND	

TABLE 3

SUMMARY OF HISTORICAL GROUNDWATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)																																	
		DL		RL		Background		Downgradient																										Blanks	
						MW-6		MW-1		MW-2		MW-3		MW-4		MW-5		MW-7		MW-8		MW-10S		P-19S											
Silver	15-Apr-08	0.10		10.0		ND		ND		ND		NS		0.32	J	WL		ND		WL		WL		WL										ND	
NC 2L = 17.5 µg/L (10/23/07)	15-Oct-08	0.10		10.0		0.27	J	AB		0.21	J	AB		ND		WL		2.8	J	WL		WL		WL										ND	
	19-Mar-09	0.10		10.0		NS		AB		NS		AB		NS		NS		NS		0.55	J	0.32	J	ND										ND	
	22-Apr-09	0.10		10.0		0.18	B	AB		0.29	B	AB		0.21	B	NS		2.9	J	0.33	B	0.46	B	0.24	B									0.14	J
	14-May-09	0.10		10.0		NS		AB		NS		AB		NS		NS		NS		0.18	B	0.25	B	0.11	B									0.29	J
	08-Oct-09	0.10		10.0		0.25	J	AB		0.51	J	AB		1.3	J	NS		2.4	J	0.41	B	0.6	J	0.27	B									ND (0.1)	J
NC 2L = 20 µg/L (01/01/10)	27-Apr-10	0.10		10.0		ND		AB		0.20	J	AB		0.57	J	NS		1.5	J	ND		ND		ND										ND	
Thallium	19-Mar-09	3.0		5.5		NS		AB		NS		AB		NS		NS		NS		4.9	J	ND		3.8	J									ND	
GWPS = 0.28 µg/L (10/23/07)	22-Apr-09	3.0		5.5		NS		AB		NS		AB		NS		NS		NS		ND		ND		ND										ND	
	14-May-09	3.0		5.5		NS		AB		NS		AB		NS		NS		NS		ND		ND		ND										ND	
	08-Oct-09	3.0		5.5		NS		AB		NS		AB		NS		NS		NS		ND		ND		ND										ND	
	27-Apr-10	3.0		5.5		ND		AB		4.5	B	AB		4.6	B	NS		6.6	B	ND		ND		ND										3.0	J
Vanadium	19-Mar-09	0.20		25.0		NS		AB		NS		AB		NS		NS		NS		73.1		16.0	J	1.6	B									0.86	J
GWPS = 3.5 µg/L (10/23/07)	22-Apr-09	0.20		25.0		NS		AB		NS		AB		NS		NS		NS		17.6	J	15.6	J	2.6	B									1.2	J
	14-May-09	0.20		25.0		NS		AB		NS		AB		NS		NS		NS		18.4	J	12.5	J	1.5	B									0.85	J
	08-Oct-09	0.20		25.0		NS		AB		NS		AB		NS		NS		NS		23.3	J	25.6		4.3	J									0.63	J
	27-Apr-10	0.20		25.0		0.55	B	AB		19.6	J	AB		1.6	B	NS		3.1	J	12.2	J	8.5	J	3.0	J									0.48	J
Zinc	19-Mar-09	0.40		10.0		NS		AB		NS		AB		NS		NS		NS		161		11.0	B	4.1	B									6.7	J
NC 2L = 1,050 µg/L (10/23/07)	22-Apr-09	0.40		10.0		NS		AB		NS		AB		NS		NS		NS		34.9		5.9	B	3.8	B									1.6	J
	14-May-09	0.40		10.0		NS		AB		NS		AB		NS		NS		NS		32.3		4.0	B	1.2	B									2.9	J
	08-Oct-09	0.40		10.0		NS		AB		NS		AB		NS		NS		NS		39.2		14.0	B	1.9	B									2.9	J
NC 2L = 1,000 µg/L (01/01/10)	27-Apr-10	0.40		10.0		ND		AB		23.2		AB		ND		NS		ND		19.9		1.6	J	ND										ND	
Acetone	27-Apr-10	2.2		100		ND		AB		ND		AB		5.6	J	NS		3.7	J	3.1	J	4.3	J	5.1	J									ND	
NC 2L = 6,000 µg/L (01/01/10)																																			
Benzene	08-Oct-09	0.25		1.0		ND		AB		ND		AB		0.46	J	NS		ND		ND		ND		ND										ND	
NC 2L = 1 µg/L (10/23/07)	27-Apr-10	0.25		1.0		ND		AB		ND		AB		0.86	J	NS		0.69	J	ND		ND		ND										ND	
1,4-Dichlorobenzene	27-Apr-10	0.33		1.0		ND		AB		ND		AB		0.46	J	NS		ND		ND		ND		ND										ND	
NC 2L = 6 µg/L (01/01/10)																																			
Cis-1,2-Dichloroethylene	11-Oct-07	0.2		5		ND		AB		ND		NS		ND		NS		0.4	J	WL		WL		WL										ND	
NC 2L = 70 µg/L (10/23/07)	15-Apr-08	0.19		5.0		ND		ND		ND		NS		ND		WL		ND		WL		WL		WL										ND	
	15-Oct-08	0.19		5.0		ND		AB		ND		AB		ND		WL		ND		WL		WL		WL										ND	
	19-Mar-09	0.19		5.0		NS		AB		NS		AB		NS		NS		NS		ND		ND		ND										ND	
	22-Apr-09	0.19		5.0		ND		AB		ND		AB		ND		NS		ND		ND		ND		ND										ND	
	14-May-09	0.19		5.0		NS		AB		NS		AB		NS		NS		NS		ND		ND		ND										ND	
	08-Oct-09	0.19		5.0		ND		AB		ND		AB		ND		NS		0.26	J	ND		ND		ND										ND	
	27-Apr-10	0.19		5.0		ND		AB		ND		AB		ND		NS		0.28	J	ND		ND		ND										ND	
4-Methyl-2-pentanone(MIBK)	08-Oct-09	0.33		100.0		ND		AB		ND		AB		0.46	J	NS		ND		ND		ND		ND										ND	
GWPS = 560 µg/L (10/23/07)	27-Apr-10	0.33		100		ND		AB		ND		AB		0.41	J	NS		ND		ND		ND		ND										ND	
Xylene(Total)	08-Oct-09	0.66		2.0		ND		AB		ND		AB		0.74	B	NS		ND		ND		ND		ND										0.76	J
NC 2L = 500 µg/L (10/23/07)	27-Apr-10	0.66		2.0		ND		AB		ND		AB		ND		NS		ND		ND		ND		ND										ND	
Alkalinity	19-Mar-09	5000		5000		NS		AB		NS		AB		NS		NS		NS		61000	B	52800	B	30500	B									26400	
	22-Apr-09	5000		5000		NS		AB		NS		AB		NS		NS		NS		57300	B	52400	B	32500	B									23900	
	14-May-09	5000		5000		NS		AB		NS		AB		NS		NS		NS		55700	B	59400	B	30700	B									22900	
	08-Oct-09	5000		5000		NS		AB		NS		AB		NS		NS		NS		58000	B	74000	B	70000	B									26000	
NC 2L/GWPS = NE (01/01/10)	27-Apr-10	5000		5000		8200	B	AB		18700	B	AB		72600	B	NS		868000		61500	B	51200	B	24600	B									20500	

TABLE 3

SUMMARY OF HISTORICAL GROUNDWATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)																													
		DL	RL	Background				Downgradient																						Blanks	
				MW-6		MW-1		MW-2		MW-3		MW-4		MW-5		MW-7		MW-8		MW-10S		P-19S			
Total Dissolved Solids	19-Mar-09	NR	40000	NS		AB		NS		AB		NS		NS		NS		104000		270000		100000		14000	J
	22-Apr-09	20000	20000	NS		AB		NS		AB		NS		NS		NS		104000	B	204000	B	84000	B	78000	
	14-May-09	20000	20000	NS		AB		NS		AB		NS		NS		NS		94000	B	210000	B	110000	B	78000	
	08-Oct-09	20000	20000	NS		AB		NS		AB		NS		NS		NS		164000	B	288000	B	152000	B	88000	
NC 2L = 500,000 µg/L (01/01/10)	27-Apr-10	100000	100000	114000	B	AB		160000	B	AB		568000		NS		1550000		112000	B	180000	B	110000	B	60000	
Resample	15-Jun-10	100000	100000	NS		AB		NS		AB		696000		NS		1560000		NS		NS		NS		ND	
Chloride	19-Mar-09	5000	5000	NS		AB		NS		AB		NS		NS		NS		6700	B	13100	B	10900	B	12000	
	22-Apr-09	5000	5000	NS		AB		NS		AB		NS		NS		NS		6900	B	13700	B	9500	B	11800	
	14-May-09	5000	5000	NS		AB		NS		AB		NS		NS		NS		7800	B	16400	B	11200	B	10700	
	08-Oct-09	5000	5000	NS		AB		NS		AB		NS		NS		NS		5500	B	17200	B	13100	B	11400	
NC 2L = 250,000 µg/L (01/01/10)	27-Apr-10	5000	5000	7900	B	AB		ND		AB		51100	D	NS		127000		ND		17500	B	12600	B	8000	
Sulfate	19-Mar-09	5000	250000	NS		AB		NS		AB		NS		NS		NS		8100	B	31400	B	16500	B	10700	J
	22-Apr-09	5000	250000	NS		AB		NS		AB		NS		NS		NS		5800	B	23300	B	16600	B	12200	J
	14-May-09	5000	250000	NS		AB		NS		AB		NS		NS		NS		11200	B	30400	B	15900	B	10700	J
	08-Oct-09	5000	250000	NS		AB		NS		AB		NS		NS		NS		ND		38500	B	6300	B	12100	J
NC 2L/GWP = NE (01/01/10)	27-Apr-10	5000	250000	ND		AB		11800	B	AB		262000	D	NS		301000	D	ND		29300	B	24000	B	10600	J

Notes:

1. All concentrations are in micrograms per liter (ug/L).
2. MW = Groundwater monitoring well.
3. RL = Laboratory reporting limit (NC SWSL {or lower} beginning in April 2007 to present).
4. DL = Laboratory detection limit.
6. ND = Not detected above laboratory reporting limit November 2000 to October 2006, not detected above laboratory detection limit April 2000 and April 2007 to present.
7. J = Estimated value between the DL and the RL April 2000 and the DL and NC SWSL (or lower) from April 2007 to present.
8. B = Blank qualified data.
9. NC 2L Standard = North Carolina's groundwater quality standard established under 15A NCAC 2L, .0202. (specific concentration established by date).
10. GWPS = Groundwater Protection Standards (specific concentration established by date).
11. Shaded values are above the NC 2L or GWP Standards.
12. AB = Monitoring well has been abandoned.
13. NS = Not sampled and/or water levels not measured.
14. NR = Not reported. Detections limits not required prior to April 2007 sampling event.
15. WL = Water levels only.
16. NA = Not available.
17. NC SWSL = North Carolina Solid Waste Section limits.

TABLE 4

SUMMARY OF HISTORICAL SURFACE WATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)							
		DL	RL	SW-1		SW-2		Blanks	
Arsenic	Apr-00	8	10	ND		ND		ND	
	Nov-00	NR	10	ND		ND		ND	
	Apr-01	NR	10	ND		ND		ND	
	Dec-01	NR	10	ND		ND		ND	
	Apr-02	NR	10	ND		ND		ND	
	Nov-02	NR	10	ND		ND		ND	
	Apr-03	NR	10	ND		ND		ND	
	Nov-03	NR	10	ND		ND		ND	
	Apr-04	NR	10	ND		ND		ND	
	Oct-04	NR	10	ND		ND		ND	
	Apr-05	NR	10	ND		ND		ND	
	Oct-05	NR	10	ND		Dry		ND	
	28-Apr-06	NR	10	ND		ND		ND	
	11-Oct-06	NR	10	ND		ND		ND	
	19-Apr-07	2.0	10	ND		2.6	B	2.1	J
	11-Oct-07	3.0	10	Dry		Dry		ND	
NC2B/EPA NC = 50 µg/L (03/28/08)	15-Apr-08	2.7	10.0	ND		ND		ND	
	15-Oct-08	2.7	10.0	ND		4.4	J	ND	
	22-Apr-09	2.7	10.0	ND		ND		ND	
	08-Oct-09	2.7	10.0	Dry		Dry		ND	
NC2B= 50 µg/L (05/1/2007)	27-Apr-10	2.7	10.0	ND		ND		ND	
Barium	Apr-00	2	8	ND		ND		ND	
	Nov-00	NR	500	ND		ND		ND	
	Apr-01	NR	500	ND		ND		ND	
	Dec-01	NR	500	ND		ND		ND	
	Apr-02	NR	500	ND		ND		ND	
	Nov-02	NR	500	ND		ND		ND	
	Apr-03	NR	500	ND		ND		ND	
	Nov-03	NR	500	ND		ND		ND	
	Apr-04	NR	500	ND		ND		ND	
	Oct-04	NR	500	ND		ND		ND	
	Apr-05	NR	500	ND		ND		ND	
	Oct-05	NR	500	ND		Dry		ND	
	28-Apr-06	NR	500	ND		ND		ND	
	11-Oct-06	NR	500	ND		ND		ND	
	19-Apr-07	0.20	100	28.1	J	40.7	J	0.30	J
	11-Oct-07	2.0	100	Dry		Dry		35.8	J
NC2B/EPA NC = NE µg/L (03/28/08)	15-Apr-08	0.20	100	19.9	J	20.0	J	ND	
	15-Oct-08	0.20	100	32.5	J	41.2	J	ND	
	22-Apr-09	0.20	100	24.5	B	24.9	B	13.4	J
	08-Oct-09	0.20	100	Dry		Dry		18.5	J
NC2B= µg/L (05/1/2007)	27-Apr-10	0.20	100	24.5	B	61.8	B	27.2	J
Beryllium	27-Apr-10	0.10	1.0	0.28	J	0.11	J	ND	
NC2B= 6.5 µg/L (05/1/2007)									
Cadmium	Apr-00	1	4	ND		ND		ND	
	Nov-00	NR	1	ND		ND		ND	
	Apr-01	NR	1	ND		ND		ND	
	Dec-01	NR	1	1.4		ND		ND	
	Apr-02	NR	1	ND		ND		ND	
	Nov-02	NR	1	ND		ND		ND	
	Apr-03	NR	1	1.2		1.2		ND	
	Nov-03	NR	1	ND		ND		ND	
	Apr-04	NR	1	ND		ND		ND	
	Oct-04	NR	1	ND		ND		ND	
	Apr-05	NR	1	ND		ND		ND	
	Oct-05	NR	1	ND		Dry		ND	
	28-Apr-06	NR	1	ND		ND		ND	
	11-Oct-06	NR	1.00	ND		ND		ND	
	19-Apr-07	0.50	1	ND		ND		ND	
	11-Oct-07	0.1	1	Dry		Dry		ND	
NC2B/EPA NC = 2 µg/L (03/28/08)	15-Apr-08	0.50	1.0	ND		ND		ND	
	15-Oct-08	0.50	1.0	ND		ND		ND	
	22-Apr-09	0.50	1.0	ND		ND		ND	
	08-Oct-09	0.50	1.0	Dry		Dry		ND	
NC2B= 2 µg/L (05/1/2007)	27-Apr-10	0.50	1.0	ND		ND		ND	

TABLE 4

SUMMARY OF HISTORICAL SURFACE WATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)				
		DL	RL	SW-1	SW-2	Blanks
Chromium	Apr-00	3	12	ND	ND	ND
	Nov-00	NR	10	ND	ND	ND
	Apr-01	NR	10	ND	ND	ND
	Dec-01	NR	10	ND	ND	ND
	Apr-02	NR	10	ND	310	45
	Nov-02	NR	10	ND	ND	ND
	Apr-03	NR	10	ND	ND	ND
	Nov-03	NR	10	ND	ND	ND
	Apr-04	NR	10	ND	ND	ND
	Oct-04	NR	10	ND	ND	ND
	Apr-05	NR	10	ND	ND	ND
	Oct-05	NR	10	ND	Dry	ND
	28-Apr-06	NR	10	ND	ND	ND
	11-Oct-06	NR	10.0	ND	ND	ND
	19-Apr-07	2.0	10	ND	ND	ND
	11-Oct-07	1.0	10	Dry	Dry	ND
NC2B/EPA NC = 50 µg/L (03/28/08)	15-Apr-08	0.40	10.0	ND	0.93 B	0.61 J
	15-Oct-08	0.40	10.0	ND	ND	ND
	22-Apr-09	0.40	10.0	ND	ND	ND
	08-Oct-09	0.40	10.0	Dry	Dry	ND
NC2B= NE µg/L (05/1/2007)	27-Apr-10	0.40	10.0	ND	0.93 J	ND
Cobalt NC2B= NE µg/L (05/1/2007)	27-Apr-10	0.60	10.0	1.8 J	1.8 J	ND
Copper NC2B = 7 µg/L (05/01/2007)	27-Apr-10	0.30	10.0	1.4 J	ND	ND
Iron NC2B = 1000 µg/L (05/01/2007)	27-Apr-10	14.0	300	1480	717	15.8 J
Lead	Apr-00	3	12	ND	ND	ND
	Nov-00	NR	10	ND	ND	ND
	Apr-01	NR	10	ND	ND	ND
	Dec-01	NR	10	ND	ND	ND
	Apr-02	NR	10	ND	ND	ND
	Nov-02	NR	10	ND	ND	ND
	Apr-03	NR	10	ND	ND	ND
	Nov-03	NR	10	ND	ND	ND
	Apr-04	NR	10	ND	ND	ND
	Oct-04	NR	10	ND	ND	ND
	Apr-05	NR	10	ND	ND	ND
	Oct-05	NR	10	ND	Dry	ND
	28-Apr-06	NR	10	ND	ND	ND
	11-Oct-06	NR	10.0	ND	ND	ND
	19-Apr-07	2.0	10	ND	ND	ND
	11-Oct-07	6.0	10	Dry	Dry	ND
NC2B/EPA NC = 25 µg/L (03/28/08)	15-Apr-08	4.0	10.0	ND	ND	ND
	15-Oct-08	4.0	10.0	ND	ND	ND
	22-Apr-09	4.0	10.0	ND	ND	ND
	08-Oct-09	4.0	10.0	Dry	Dry	ND
NC2B = 25 µg/L (05/01/2007)	27-Apr-10	4.0	10.0	ND	ND	ND
Manganese NC2B = NE µg/L (05/01/2007)	27-Apr-10	0.30	50.0	378	653	4.8 J

TABLE 4

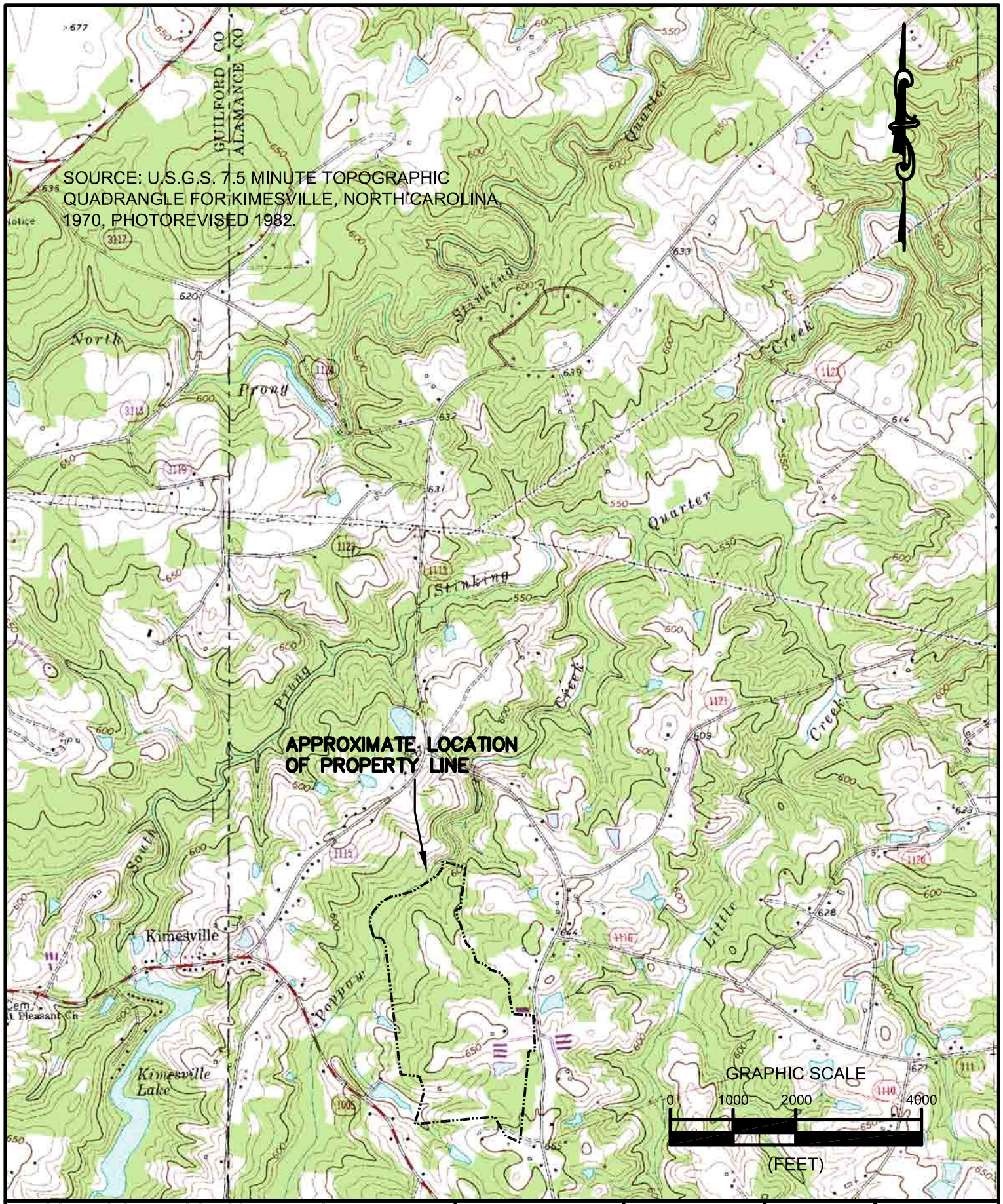
SUMMARY OF HISTORICAL SURFACE WATER CONSTITUENTS

Constituent	Date	Concentration (µg/L)							
		DL	RL	SW-1		SW-2		Blanks	
Selenium	Apr-00	4	16	ND		ND		ND	
	Nov-00	NR	20	ND		ND		ND	
	Apr-01	NR	20	ND		ND		ND	
	Dec-01	NR	20	ND		ND		ND	
	Apr-02	NR	20	ND		ND		ND	
	Nov-02	NR	20	ND		ND		ND	
	Apr-03	NR	20	ND		ND		ND	
	Nov-03	NR	20	ND		ND		ND	
	Apr-04	NR	20	ND		ND		ND	
	Oct-04	NR	20	ND		ND		ND	
	Apr-05	NR	20	ND		ND		ND	
	Oct-05	NR	20	ND		Dry		ND	
	28-Apr-06	NR	20	ND		ND		ND	
	11-Oct-06	NR	20.0	ND		ND		ND	
	19-Apr-07	2.0	10	ND		ND		3.5	J
	11-Oct-07	2.0	10	Dry		Dry		ND	
NC2B/EPA NC = 5 µg/L (03/28/08)	15-Apr-08	3.8	10.0	ND		ND		ND	
	15-Oct-08	3.8	10.0	ND		8.5	B	5.6	J
	22-Apr-09	3.8	10.0	ND		ND		ND	
	08-Oct-09	3.8	10.0	Dry		Dry		ND	
NC2B = 5 µg/L (05/01/2007)	27-Apr-10	3.8	10.0	ND		ND		ND	
Silver	15-Apr-08	0.10	10.0	ND		ND		ND	
NC2B/EPA NC = 0.06 µg/L (03/28/08)	15-Oct-08	0.10	10.0	0.13	J	0.11	J	ND	
	22-Apr-09	0.10	10.0	0.16	B	0.30	B	0.14	J
	08-Oct-09	0.10	10.0	Dry		Dry		ND	
NC2B = 0.06 µg/L (05/01/2007)	27-Apr-10	0.10	10.0	0.38	J	ND		ND	
Vanadium NC2B = NE µg/L (05/01/2007)	27-Apr-10	0.20	25.0	2.0	J	0.93	J	0.48	J
Alkalinity NC2B = NE µg/L (05/01/2007)	27-Apr-10	5000	5000	38900	B	61500	B	20500	
Total Dissolved Solids NC2B = NE µg/L (05/01/2007)	27-Apr-10	100000	100000	88000	B	182000	B	60000	
Chloride NC2B = 230000 µg/L (05/01/2007)	27-Apr-10	5000	5000	7200	B	8100	B	8000	
Sulfate NC2B = NE µg/L (05/01/2007)	27-Apr-10	5000	250000	7800	B	23600	B	10600	

1. All concentrations are in micrograms per liter (mg/L).
2. SW = Surface water monitoring point.
3. RL = Laboratory reporting limit (NC SWSL {or lower} beginning in April 2007 to present).
4. DL = Laboratory detection limit.
5. ND = Not detected above laboratory reporting limit November 2000 to October 2006, not detected above laboratory detection limit April 2000 and April 2007 to present.
6. J = Estimated value between the DL and the RL April 2000 and the DL and NC SWSL (or lower) from April 2007 to present.
7. B = Blank qualified data.
8. NC 2B Standard = North Carolina's surface water standards (specific concentration established by date).
9. Shaded values are above the NC 2B Surface Water Standards
10. - = No data available/not reported.
11. NC SWSL = North Carolina Solid Waste Section limits.
12. The classification of the surface waters for Coble's Sandrock is Freshwater Aqudic Life.
13. NR = Not reported. Detections limits not required prior to April 2007 sampling event.
14. Dry = Surface water monitoring point was dry. No sample collected.
15. NE = Concentration not established.

Figure

Figure No. 1 Site Location Map

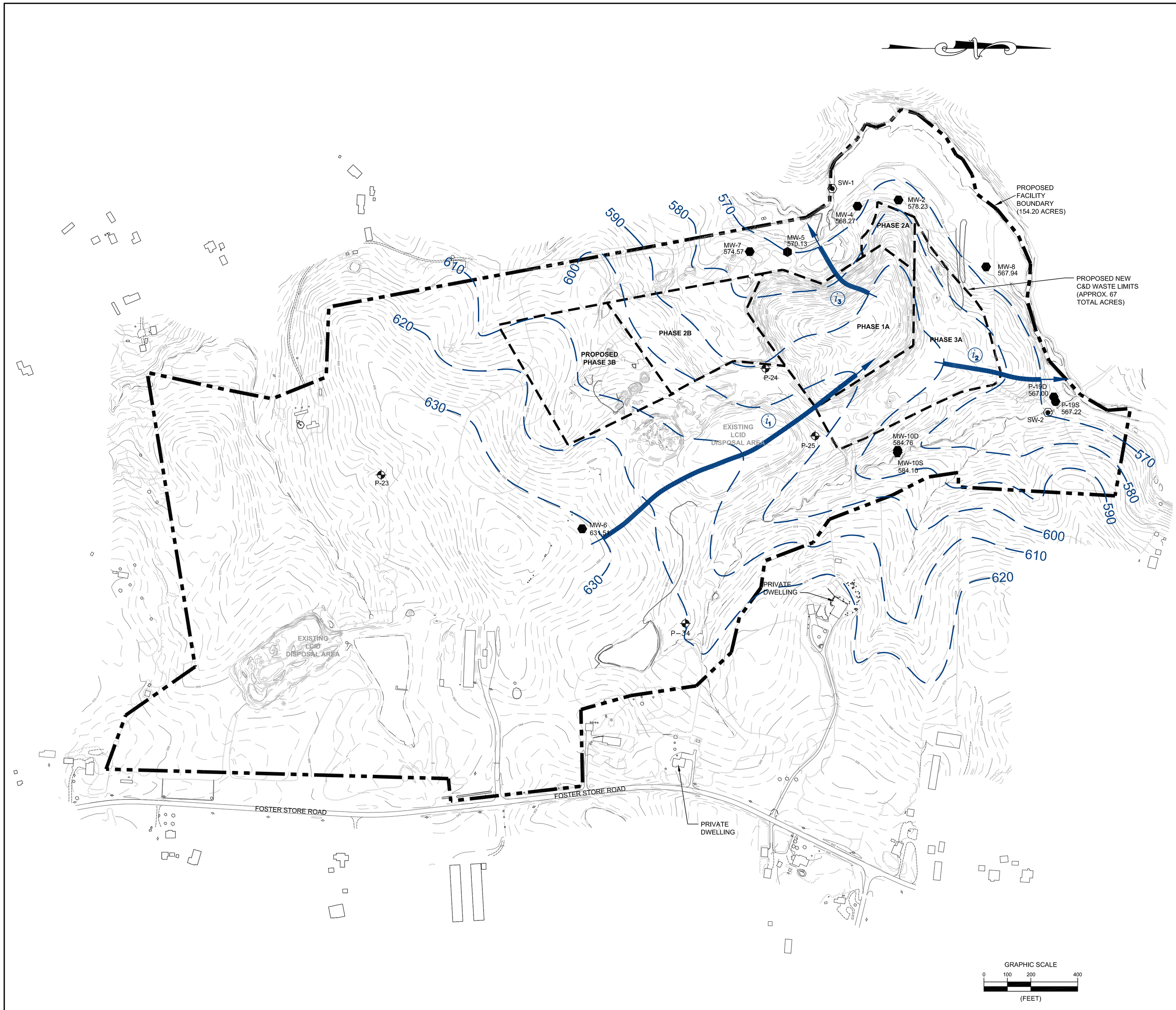


COBLE'S SANDROCK C&D DEBRIS LANDFILL KIMESVILLE, NC	JOYCE ENGINEERING, INC. 2211 W. MEADOWVIEW ROAD GREENSBORO, NC 27407 PHONE: (336) 323-0092	DESIGNED RB DRAWN CADD/RB CHECKED JJK APPROVED JJK DATE 06/07/10	SCALE AS SHOWN	PROJECT NO. 00419.1000.12
SITE LOCATION MAP		© 2010 Joyce Engineering, Inc. All rights reserved.		FIGURE NO. 1

P:\Coble's Sandrock\Coble's Sandrock C&D Landfill\Groundwater\Semiannual Groundwater Reports\April 2010\CAD Drawings\, Cobles Sandrock Site Location Map April 2010.dwg

Drawing

Drawing No. 1 Groundwater Surface Contour Map, April 26, 2010



LEGEND

- EXISTING 2' CONTOURS
- EXISTING 10' CONTOURS
- GROUNDWATER CONTOURS
- EXISTING CELL BOUNDARIES
- GROUNDWATER FLOW DIRECTION WITH GRADIENT CALCULATION SEGMENT
- SEGMENT USED FOR GRADIENT CALCULATIONS — i_1
- PIEZOMETER LOCATION — P-32
- GROUNDWATER MONITORING WELL LOCATION AND IDENTIFICATION — MW-6 631.51

NOTES:

1. TOPOGRAPHIC CONTOUR INTERVAL= 2 FEET.
2. GROUNDWATER SURFACE CONTOUR = 10 FEET.

DATE	REVISIONS AND RECORD OF ISSUE	NO	BY	CK	APP

DESIGNED CTM
DRAWN JJK
CHECKED JJK
APPROVED JJK
DATE 06/07/10

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JOYCE ENGINEERING, INC.
2211 W. MEADOWVIEW ROAD
GREENSBORO, NC 27407
PHONE: (336) 323-0092
NC CORP LIC: C-0782

COBLES SANDROCK, INC.
KIMESVILLE, NORTH CAROLINA

GROUNDWATER SURFACE CONTOUR MAP
APRIL 26, 2010

PROJECT NO.
00419.1000.12

SCALE
AS NOTED

DRAWING NO.
1

P:\Cobble's Sandrock\Environmental\Groundwater\Semiannual Groundwater Reports\April 2010\CAD Drawings\Cobles Sandrock GW Map April 2010.dwg Layout=Layout1

Appendices

Appendix 1 Laboratory Analytical Report and Field Data Logs
Appendix 2 Statistical Analyses Worksheets

Appendix 1 Laboratory Analytical Report and Field Data Logs

Pace Analytical Services, Inc.
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 04, 2010

Mr. Jeremey Kerly
Joyce Engineering-NC
2211 West Meadowview Rd
Suite 101
Greensboro, NC 27407

RE: Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Dear Mr. Kerly:
Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Huntersville laboratory unless otherwise footnoted. All Microbiological analyses were performed at the laboratory where the samples were received.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin

kevin.godwin@pacelabs.com
Project Manager

Enclosures

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Pace Analytical Services, Inc.
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CERTIFICATIONS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Charlotte Certification IDs

9800 Kincey Ave. - Ste 100 Huntersville, NC 28078
West Virginia Certification #: 357
Connecticut Certification #: PH-0104
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Louisiana/LELAP Certification #: 04034
New Jersey Certification #: NC012
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
Pennsylvania Certification #: 68-00784
South Carolina Certification #: 99006001
South Carolina Drinking Water Cert. #: 99006003
Tennessee Certification #: 04010
Virginia Certification #: 00213

Asheville Certification IDs

2225 Riverside Dr. Asheville, NC 28804
Connecticut Certification #: PH-0106
Louisiana/LELAP Certification #: 03095
Massachusetts Certification #: M-NC030
New Jersey Certification #: NC011
North Carolina Bioassay Certification #: 9
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
Pennsylvania Certification #: 68-03578
South Carolina Bioassay Certification #: 9903002
South Carolina Certification #: 9903001
Tennessee Certification #: 2980
Virginia Certification #: 00072
West Virginia Certification #: 356
Florida/NELAP Certification #: E87648

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SAMPLE SUMMARY

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Lab ID	Sample ID	Matrix	Date Collected	Date Received
9268301001	**0105-MW2 MS/MSD**	Water	04/27/10 10:40	04/28/10 15:40
9268301002	**0105-MW4**	Water	04/27/10 11:00	04/28/10 15:40
9268301003	**0105-MW6**	Water	04/27/10 09:05	04/28/10 15:40
9268301004	**0105-MW7**	Water	04/27/10 11:25	04/28/10 15:40
9268301005	**0105-MW8**	Water	04/27/10 10:15	04/28/10 15:40
9268301006	**0105-MW10S**	Water	04/27/10 09:30	04/28/10 15:40
9268301007	**0105-P19S**	Water	04/27/10 09:45	04/28/10 15:40
9268301008	**0105-SW1**	Water	04/27/10 11:15	04/28/10 15:40
9268301009	**0105-SW2**	Water	04/27/10 10:00	04/28/10 15:40
9268301010	**0105-FIELD BLANK**	Water	04/27/10 11:40	04/28/10 15:40
9268301011	**0105-TRIP BLANK**	Water	04/27/10 00:00	04/28/10 15:40

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(704)875-9092

SAMPLE ANALYTE COUNT

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Lab ID	Sample ID	Method	Analysts	Analytes Reported
9268301001	**0105-MW2 MS/MSD**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301002	**0105-MW4**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301003	**0105-MW6**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301004	**0105-MW7**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301005	**0105-MW8**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301006	**0105-MW10S**	EPA 6010	JMW	17
		EPA 7470	SHB	1

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SAMPLE ANALYTE COUNT

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301007	**0105-P19S**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301008	**0105-SW1**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301009	**0105-SW2**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301010	**0105-FIELD BLANK**	EPA 6010	JMW	17
		EPA 7470	SHB	1
		EPA 8260	MCK	54
		SM 2320B	SDH	1
		SM 2540C	MLM	1
		SM 4500-Cl-E	JDA	1
		ASTM D516-90	DMN	1
9268301011	**0105-TRIP BLANK**	EPA 8260	MCK	54

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW2 MS/MSD **Lab ID: 9268301001** Collected: 04/27/10 10:40 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010		Preparation Method: EPA 3010						
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 20:52	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 20:52	7440-38-2	
Barium	**54.9J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 20:52	7440-39-3	
Beryllium	**0.38J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 20:52	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 20:52	7440-43-9	
Chromium	**14.2**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 20:52	7440-47-3	
Cobalt	ND	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 20:52	7440-48-4	
Copper	**9.4J**	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 20:52	7440-50-8	
Iron	**10900**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 20:52	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 20:52	7439-92-1	
Manganese	**99.6**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 20:52	7439-96-5	
Nickel	**11.7J**	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 20:52	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 20:52	7782-49-2	
Silver	**0.20J**	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 20:52	7440-22-4	
Thallium	**4.5J**	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 20:52	7440-28-0	
Vanadium	**19.6J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 20:52	7440-62-2	
Zinc	**23.2**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 20:52	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470		Preparation Method: EPA 7470						
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 12:38	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	2.2	1		05/04/10 17:09	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 17:09	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 17:09	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 17:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 17:09	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 17:09	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 17:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 17:09	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 17:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 17:09	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 17:09	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 17:09	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 17:09	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 17:09	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 17:09	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 17:09	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 17:09	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 17:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 17:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 17:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 17:09	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 17:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 17:09	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 17:09	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW2 MS/MSD **Lab ID: 9268301001** Collected: 04/27/10 10:40 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 17:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 17:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 17:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 17:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 17:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 17:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 17:09	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 17:09	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 17:09	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 17:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 17:09	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 17:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 17:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 17:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 17:09	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 17:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 17:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 17:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 17:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 17:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 17:09	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 17:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 17:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 17:09	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 17:09	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 17:09	95-47-6	
4-Bromofluorobenzene (S)	99	%	87-109		1		05/04/10 17:09	460-00-4	
Dibromofluoromethane (S)	102	%	85-115		1		05/04/10 17:09	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%	79-120		1		05/04/10 17:09	17060-07-0	
Toluene-d8 (S)	99	%	70-120		1		05/04/10 17:09	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**18.7**	mg/L	5.0	5.0	1		04/30/10 13:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**160**	mg/L	100	100	1		04/30/10 22:40		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	ND	mg/L	5.0	5.0	1		05/04/10 10:09	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**11.8J**	mg/L	250	5.0	1		05/11/10 22:53	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW4 **Lab ID: 9268301002** Collected: 04/27/10 11:00 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010		Preparation Method: EPA 3010						
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:03	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:03	7440-38-2	
Barium	**111**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:03	7440-39-3	
Beryllium	**0.16J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:03	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:03	7440-43-9	
Chromium	**1.9J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:03	7440-47-3	
Cobalt	**1.4J**	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:03	7440-48-4	
Copper	ND	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:03	7440-50-8	
Iron	**642**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:03	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:03	7439-92-1	
Manganese	**750**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:03	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:03	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:03	7782-49-2	
Silver	**0.57J**	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:03	7440-22-4	
Thallium	**4.6J**	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:03	7440-28-0	
Vanadium	**1.6J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:03	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:03	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470		Preparation Method: EPA 7470						
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 12:46	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	**5.6J**	ug/L	100	2.2	1		05/04/10 17:33	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 17:33	107-13-1	
Benzene	**0.86J**	ug/L	1.0	0.25	1		05/04/10 17:33	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 17:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 17:33	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 17:33	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 17:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 17:33	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 17:33	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 17:33	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 17:33	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 17:33	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 17:33	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 17:33	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 17:33	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 17:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 17:33	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 17:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 17:33	95-50-1	
1,4-Dichlorobenzene	**0.46J**	ug/L	1.0	0.33	1		05/04/10 17:33	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 17:33	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 17:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 17:33	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 17:33	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW4 **Lab ID: 9268301002** Collected: 04/27/10 11:00 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 17:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 17:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 17:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 17:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 17:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 17:33	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 17:33	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 17:33	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 17:33	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 17:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.41J**	ug/L	100	0.33	1		05/04/10 17:33	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 17:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 17:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 17:33	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 17:33	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 17:33	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 17:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 17:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 17:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 17:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 17:33	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 17:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 17:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 17:33	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 17:33	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 17:33	95-47-6	
4-Bromofluorobenzene (S)	99	%	87-109		1		05/04/10 17:33	460-00-4	
Dibromofluoromethane (S)	102	%	85-115		1		05/04/10 17:33	1868-53-7	
1,2-Dichloroethane-d4 (S)	99	%	79-120		1		05/04/10 17:33	17060-07-0	
Toluene-d8 (S)	99	%	70-120		1		05/04/10 17:33	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**72.6**	mg/L	5.0	5.0	1		04/30/10 13:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**568**	mg/L	20.0	20.0	1		04/30/10 22:41		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**51.1**	mg/L	10.0	10.0	2		05/04/10 10:20	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**262J**	mg/L	3500	70.0	14		05/11/10 23:52	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW6 **Lab ID: 9268301003** Collected: 04/27/10 09:05 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010		Preparation Method: EPA 3010						
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:07	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:07	7440-38-2	
Barium	**42.1J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:07	7440-39-3	
Beryllium	**0.32J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:07	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:07	7440-43-9	
Chromium	**0.41J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:07	7440-47-3	
Cobalt	ND	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:07	7440-48-4	
Copper	ND	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:07	7440-50-8	
Iron	**242J**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:07	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:07	7439-92-1	
Manganese	**9.4J**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:07	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:07	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:07	7782-49-2	
Silver	ND	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:07	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:07	7440-28-0	
Vanadium	**0.55J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:07	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:07	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470		Preparation Method: EPA 7470						
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 12:48	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	2.2	1		05/04/10 17:57	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 17:57	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 17:57	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 17:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 17:57	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 17:57	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 17:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 17:57	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 17:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 17:57	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 17:57	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 17:57	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 17:57	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 17:57	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 17:57	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 17:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 17:57	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 17:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 17:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 17:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 17:57	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 17:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 17:57	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 17:57	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW6 **Lab ID: 9268301003** Collected: 04/27/10 09:05 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 17:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 17:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 17:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 17:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 17:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 17:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 17:57	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 17:57	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 17:57	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 17:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 17:57	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 17:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 17:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 17:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 17:57	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 17:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 17:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 17:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 17:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 17:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 17:57	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 17:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 17:57	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 17:57	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 17:57	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 17:57	95-47-6	
4-Bromofluorobenzene (S)	99	%	87-109		1		05/04/10 17:57	460-00-4	
Dibromofluoromethane (S)	102	%	85-115		1		05/04/10 17:57	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%	79-120		1		05/04/10 17:57	17060-07-0	
Toluene-d8 (S)	99	%	70-120		1		05/04/10 17:57	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**8.2**	mg/L	5.0	5.0	1		05/03/10 16:11		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**114**	mg/L	20.0	20.0	1		04/30/10 22:41		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**7.9**	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	ND	mg/L	250	5.0	1		05/11/10 22:55	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW7 **Lab ID: 9268301004** Collected: 04/27/10 11:25 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010		Preparation Method: EPA 3010						
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:10	7440-36-0	
Arsenic	**5.8J**	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:10	7440-38-2	
Barium	**333**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:10	7440-39-3	
Beryllium	ND	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:10	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:10	7440-43-9	
Chromium	**4.3J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:10	7440-47-3	
Cobalt	**25.6**	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:10	7440-48-4	
Copper	ND	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:10	7440-50-8	
Iron	**11300**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:10	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:10	7439-92-1	
Manganese	**18600**	ug/L	500	3.0	10	05/06/10 14:45	05/11/10 17:47	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:10	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:10	7782-49-2	
Silver	**1.5J**	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:10	7440-22-4	
Thallium	**6.6**	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:10	7440-28-0	
Vanadium	**3.1J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:10	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:10	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470		Preparation Method: EPA 7470						
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 12:55	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	**3.7J**	ug/L	100	2.2	1		05/04/10 18:21	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 18:21	107-13-1	
Benzene	**0.69J**	ug/L	1.0	0.25	1		05/04/10 18:21	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 18:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 18:21	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 18:21	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 18:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 18:21	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 18:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 18:21	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 18:21	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 18:21	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 18:21	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 18:21	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 18:21	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 18:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 18:21	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 18:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 18:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 18:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 18:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 18:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 18:21	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 18:21	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW7 **Lab ID: 9268301004** Collected: 04/27/10 11:25 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 18:21	75-35-4	
cis-1,2-Dichloroethene	**0.28J**	ug/L	5.0	0.19	1		05/04/10 18:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 18:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 18:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 18:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 18:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 18:21	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 18:21	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 18:21	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 18:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 18:21	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 18:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 18:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 18:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 18:21	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 18:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 18:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 18:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 18:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 18:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 18:21	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 18:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 18:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 18:21	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 18:21	179601-23-1	
o-Xylene	**0.25J**	ug/L	1.0	0.23	1		05/04/10 18:21	95-47-6	
4-Bromofluorobenzene (S)	98	%	87-109		1		05/04/10 18:21	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 18:21	1868-53-7	
1,2-Dichloroethane-d4 (S)	99	%	79-120		1		05/04/10 18:21	17060-07-0	
Toluene-d8 (S)	100	%	70-120		1		05/04/10 18:21	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**868**	mg/L	5.0	5.0	1		05/03/10 16:11		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1550**	mg/L	20.0	20.0	1		04/30/10 22:42		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**127**	mg/L	25.0	25.0	5		05/04/10 12:35	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**301J**	mg/L	3000	60.0	12		05/11/10 23:52	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW8 **Lab ID: 9268301005** Collected: 04/27/10 10:15 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010		Preparation Method: EPA 3010						
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:14	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:14	7440-38-2	
Barium	**74.9J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:14	7440-39-3	
Beryllium	**0.21J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:14	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:14	7440-43-9	
Chromium	**4.9J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:14	7440-47-3	
Cobalt	**3.4J**	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:14	7440-48-4	
Copper	**1.4J**	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:14	7440-50-8	
Iron	**11000**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:14	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:14	7439-92-1	
Manganese	**137**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:14	7439-96-5	
Nickel	**2.5J**	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:14	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:14	7782-49-2	
Silver	ND	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:14	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:14	7440-28-0	
Vanadium	**12.2J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:14	7440-62-2	
Zinc	**19.9**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:14	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470		Preparation Method: EPA 7470						
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 12:58	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	**3.1J**	ug/L	100	2.2	1		05/04/10 18:45	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 18:45	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 18:45	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 18:45	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 18:45	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 18:45	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 18:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 18:45	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 18:45	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 18:45	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 18:45	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 18:45	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 18:45	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 18:45	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 18:45	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 18:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 18:45	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 18:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 18:45	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 18:45	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 18:45	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 18:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 18:45	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 18:45	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW8 **Lab ID: 9268301005** Collected: 04/27/10 10:15 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 18:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 18:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 18:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 18:45	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 18:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 18:45	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 18:45	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 18:45	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 18:45	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 18:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 18:45	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 18:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 18:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 18:45	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 18:45	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 18:45	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 18:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 18:45	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 18:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 18:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 18:45	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 18:45	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 18:45	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 18:45	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 18:45	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 18:45	95-47-6	
4-Bromofluorobenzene (S)	99	%	87-109		1		05/04/10 18:45	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 18:45	1868-53-7	
1,2-Dichloroethane-d4 (S)	101	%	79-120		1		05/04/10 18:45	17060-07-0	
Toluene-d8 (S)	100	%	70-120		1		05/04/10 18:45	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**61.5**	mg/L	5.0	5.0	1		05/03/10 16:12		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**112**	mg/L	20.0	20.0	1		04/30/10 22:42		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	ND	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	ND	mg/L	250	5.0	1		05/12/10 00:11	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW10S **Lab ID: 9268301006** Collected: 04/27/10 09:30 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:17	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:17	7440-38-2	
Barium	**62.0J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:17	7440-39-3	
Beryllium	**0.13J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:17	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:17	7440-43-9	
Chromium	**7.6J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:17	7440-47-3	
Cobalt	ND	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:17	7440-48-4	
Copper	**8.0J**	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:17	7440-50-8	
Iron	**2940**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:17	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:17	7439-92-1	
Manganese	**347**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:17	7439-96-5	
Nickel	**3.5J**	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:17	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:17	7782-49-2	
Silver	ND	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:17	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:17	7440-28-0	
Vanadium	**8.5J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:17	7440-62-2	
Zinc	**1.6J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:17	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 13:00	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	**4.3J**	ug/L	100	2.2	1		05/04/10 19:09	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 19:09	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 19:09	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 19:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 19:09	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 19:09	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 19:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 19:09	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 19:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 19:09	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 19:09	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 19:09	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 19:09	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 19:09	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 19:09	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 19:09	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 19:09	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 19:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 19:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 19:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 19:09	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 19:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 19:09	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 19:09	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-MW10S **Lab ID: 9268301006** Collected: 04/27/10 09:30 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 19:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 19:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 19:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 19:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 19:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 19:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 19:09	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 19:09	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 19:09	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 19:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 19:09	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 19:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 19:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 19:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 19:09	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 19:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 19:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 19:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 19:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 19:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 19:09	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 19:09	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 19:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 19:09	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 19:09	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 19:09	95-47-6	
4-Bromofluorobenzene (S)	99	%	87-109		1		05/04/10 19:09	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 19:09	1868-53-7	
1,2-Dichloroethane-d4 (S)	103	%	79-120		1		05/04/10 19:09	17060-07-0	
Toluene-d8 (S)	101	%	70-120		1		05/04/10 19:09	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**51.2**	mg/L	5.0	5.0	1		05/03/10 16:13		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**180**	mg/L	20.0	20.0	1		04/30/10 22:44		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**17.5**	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**29.3J**	mg/L	250	5.0	1		05/11/10 22:55	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-P19S **Lab ID: 9268301007** Collected: 04/27/10 09:45 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:30	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:30	7440-38-2	
Barium	**79.7J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:30	7440-39-3	
Beryllium	ND	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:30	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:30	7440-43-9	
Chromium	**0.46J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:30	7440-47-3	
Cobalt	**4.4J**	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:30	7440-48-4	
Copper	**1.1J**	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:30	7440-50-8	
Iron	**1070**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:30	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:30	7439-92-1	
Manganese	**793**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:30	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:30	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:30	7782-49-2	
Silver	ND	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:30	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:30	7440-28-0	
Vanadium	**3.0J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:30	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:30	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 13:03	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	**5.1J**	ug/L	100	2.2	1		05/04/10 19:33	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 19:33	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 19:33	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 19:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 19:33	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 19:33	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 19:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 19:33	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 19:33	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 19:33	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 19:33	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 19:33	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 19:33	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 19:33	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 19:33	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 19:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 19:33	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 19:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 19:33	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 19:33	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 19:33	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 19:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 19:33	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 19:33	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-P19S **Lab ID: 9268301007** Collected: 04/27/10 09:45 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 19:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 19:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 19:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 19:33	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 19:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 19:33	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 19:33	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 19:33	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 19:33	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 19:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 19:33	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 19:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 19:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 19:33	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 19:33	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 19:33	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 19:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 19:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 19:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 19:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 19:33	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 19:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 19:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 19:33	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 19:33	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 19:33	95-47-6	
4-Bromofluorobenzene (S)	98	%	87-109		1		05/04/10 19:33	460-00-4	
Dibromofluoromethane (S)	104	%	85-115		1		05/04/10 19:33	1868-53-7	
1,2-Dichloroethane-d4 (S)	104	%	79-120		1		05/04/10 19:33	17060-07-0	
Toluene-d8 (S)	100	%	70-120		1		05/04/10 19:33	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**24.6**	mg/L	5.0	5.0	1		05/03/10 16:13		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**110**	mg/L	20.0	20.0	1		04/30/10 22:44		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**12.6**	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**24.0J**	mg/L	250	5.0	1		05/12/10 00:11	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-SW1 **Lab ID: 9268301008** Collected: 04/27/10 11:15 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/11/10 17:44	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/11/10 17:44	7440-38-2	
Barium	**24.5J**	ug/L	100	0.20	1	05/06/10 14:45	05/11/10 17:44	7440-39-3	
Beryllium	**0.28J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/11/10 17:44	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/11/10 17:44	7440-43-9	
Chromium	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/11/10 17:44	7440-47-3	
Cobalt	**1.8J**	ug/L	10.0	0.60	1	05/06/10 14:45	05/11/10 17:44	7440-48-4	
Copper	**1.4J**	ug/L	10.0	0.30	1	05/06/10 14:45	05/11/10 17:44	7440-50-8	
Iron	**1480**	ug/L	300	14.0	1	05/06/10 14:45	05/11/10 17:44	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/11/10 17:44	7439-92-1	
Manganese	**378**	ug/L	50.0	0.30	1	05/06/10 14:45	05/11/10 17:44	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/11/10 17:44	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/11/10 17:44	7782-49-2	
Silver	**0.38J**	ug/L	10.0	0.10	1	05/06/10 14:45	05/11/10 17:44	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/11/10 17:44	7440-28-0	
Vanadium	**2.0J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/11/10 17:44	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/11/10 17:44	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 13:05	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	2.2	1		05/04/10 19:57	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 19:57	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 19:57	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 19:57	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 19:57	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 19:57	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 19:57	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 19:57	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 19:57	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 19:57	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 19:57	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 19:57	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 19:57	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 19:57	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 19:57	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 19:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 19:57	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 19:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 19:57	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 19:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 19:57	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 19:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 19:57	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 19:57	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-SW1 **Lab ID: 9268301008** Collected: 04/27/10 11:15 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 19:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 19:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 19:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 19:57	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 19:57	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 19:57	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 19:57	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 19:57	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 19:57	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 19:57	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 19:57	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 19:57	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 19:57	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 19:57	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 19:57	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 19:57	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 19:57	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 19:57	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 19:57	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 19:57	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 19:57	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 19:57	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 19:57	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 19:57	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 19:57	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 19:57	95-47-6	
4-Bromofluorobenzene (S)	100	%	87-109		1		05/04/10 19:57	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 19:57	1868-53-7	
1,2-Dichloroethane-d4 (S)	103	%	79-120		1		05/04/10 19:57	17060-07-0	
Toluene-d8 (S)	101	%	70-120		1		05/04/10 19:57	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**38.9**	mg/L	5.0	5.0	1		05/03/10 16:13		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**88.0**	mg/L	20.0	20.0	1		04/30/10 22:45		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**7.2**	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**7.8J**	mg/L	250	5.0	1		05/12/10 00:11	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-SW2 **Lab ID: 9268301009** Collected: 04/27/10 10:00 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:37	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:37	7440-38-2	
Barium	**61.8J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:37	7440-39-3	
Beryllium	**0.11J**	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:37	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:37	7440-43-9	
Chromium	**0.93J**	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:37	7440-47-3	
Cobalt	**1.8J**	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:37	7440-48-4	
Copper	ND	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:37	7440-50-8	
Iron	**717**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:37	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:37	7439-92-1	
Manganese	**653**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:37	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:37	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:37	7782-49-2	
Silver	ND	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:37	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:37	7440-28-0	
Vanadium	**0.93J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:37	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:37	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 13:08	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	2.2	1		05/04/10 20:21	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 20:21	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 20:21	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 20:21	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 20:21	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 20:21	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 20:21	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 20:21	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 20:21	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 20:21	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 20:21	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 20:21	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 20:21	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 20:21	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 20:21	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 20:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 20:21	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 20:21	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 20:21	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 20:21	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 20:21	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 20:21	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 20:21	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 20:21	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-SW2 **Lab ID: 9268301009** Collected: 04/27/10 10:00 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 20:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 20:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 20:21	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 20:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 20:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 20:21	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 20:21	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 20:21	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 20:21	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 20:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 20:21	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 20:21	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 20:21	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 20:21	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 20:21	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 20:21	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 20:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 20:21	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 20:21	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 20:21	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 20:21	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 20:21	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 20:21	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 20:21	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 20:21	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 20:21	95-47-6	
4-Bromofluorobenzene (S)	98	%	87-109		1		05/04/10 20:21	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 20:21	1868-53-7	
1,2-Dichloroethane-d4 (S)	103	%	79-120		1		05/04/10 20:21	17060-07-0	
Toluene-d8 (S)	100	%	70-120		1		05/04/10 20:21	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**61.5**	mg/L	5.0	5.0	1		05/03/10 16:14		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**182**	mg/L	20.0	20.0	1		04/30/10 22:45		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**8.1**	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**23.6J**	mg/L	250	5.0	1		05/11/10 22:58	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-FIELD BLANK **Lab ID: 9268301010** Collected: 04/27/10 11:40 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Antimony	ND	ug/L	6.0	2.6	1	05/06/10 14:45	05/10/10 21:41	7440-36-0	
Arsenic	ND	ug/L	10.0	2.7	1	05/06/10 14:45	05/10/10 21:41	7440-38-2	
Barium	**27.2J**	ug/L	100	0.20	1	05/06/10 14:45	05/10/10 21:41	7440-39-3	
Beryllium	ND	ug/L	1.0	0.10	1	05/06/10 14:45	05/10/10 21:41	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	05/06/10 14:45	05/10/10 21:41	7440-43-9	
Chromium	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:41	7440-47-3	
Cobalt	ND	ug/L	10.0	0.60	1	05/06/10 14:45	05/10/10 21:41	7440-48-4	
Copper	ND	ug/L	10.0	0.30	1	05/06/10 14:45	05/10/10 21:41	7440-50-8	
Iron	**15.8J**	ug/L	300	14.0	1	05/06/10 14:45	05/10/10 21:41	7439-89-6	
Lead	ND	ug/L	10.0	4.0	1	05/06/10 14:45	05/10/10 21:41	7439-92-1	
Manganese	**4.8J**	ug/L	50.0	0.30	1	05/06/10 14:45	05/10/10 21:41	7439-96-5	
Nickel	ND	ug/L	50.0	1.7	1	05/06/10 14:45	05/10/10 21:41	7440-02-0	
Selenium	ND	ug/L	10.0	3.8	1	05/06/10 14:45	05/10/10 21:41	7782-49-2	
Silver	ND	ug/L	10.0	0.10	1	05/06/10 14:45	05/10/10 21:41	7440-22-4	
Thallium	ND	ug/L	5.5	3.0	1	05/06/10 14:45	05/10/10 21:41	7440-28-0	
Vanadium	**0.48J**	ug/L	25.0	0.20	1	05/06/10 14:45	05/10/10 21:41	7440-62-2	
Zinc	ND	ug/L	10.0	0.40	1	05/06/10 14:45	05/10/10 21:41	7440-66-6	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.070	1	05/03/10 15:10	05/04/10 13:10	7439-97-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	2.2	1		05/04/10 20:45	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 20:45	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 20:45	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 20:45	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 20:45	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 20:45	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 20:45	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 20:45	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 20:45	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 20:45	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 20:45	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 20:45	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 20:45	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 20:45	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 20:45	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 20:45	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 20:45	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 20:45	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 20:45	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 20:45	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 20:45	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 20:45	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 20:45	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 20:45	540-59-0	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-FIELD BLANK **Lab ID: 9268301010** Collected: 04/27/10 11:40 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 20:45	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 20:45	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 20:45	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 20:45	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 20:45	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 20:45	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 20:45	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 20:45	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 20:45	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 20:45	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 20:45	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 20:45	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 20:45	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 20:45	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 20:45	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 20:45	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 20:45	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 20:45	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 20:45	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 20:45	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 20:45	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 20:45	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 20:45	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 20:45	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 20:45	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 20:45	95-47-6	
4-Bromofluorobenzene (S)	100	%	87-109		1		05/04/10 20:45	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 20:45	1868-53-7	
1,2-Dichloroethane-d4 (S)	103	%	79-120		1		05/04/10 20:45	17060-07-0	
Toluene-d8 (S)	100	%	70-120		1		05/04/10 20:45	2037-26-5	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**20.5**	mg/L	5.0	5.0	1		05/03/10 16:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**60.0**	mg/L	20.0	20.0	1		04/30/10 22:46		
4500 Chloride	Analytical Method: SM 4500-Cl-E								
Chloride	**8.0**	mg/L	5.0	5.0	1		05/04/10 10:11	16887-00-6	
ASTM D516-90 Sulfate Water	Analytical Method: ASTM D516-90								
Sulfate	**10.6J**	mg/L	250	5.0	1		05/11/10 22:58	14808-79-8	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-TRIP BLANK **Lab ID: 9268301011** Collected: 04/27/10 00:00 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	2.2	1		05/04/10 21:09	67-64-1	
Acrylonitrile	ND	ug/L	200	1.9	1		05/04/10 21:09	107-13-1	
Benzene	ND	ug/L	1.0	0.25	1		05/04/10 21:09	71-43-2	
Bromochloromethane	ND	ug/L	3.0	0.17	1		05/04/10 21:09	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		05/04/10 21:09	75-27-4	
Bromoform	ND	ug/L	3.0	0.26	1		05/04/10 21:09	75-25-2	
Bromomethane	ND	ug/L	10.0	0.29	1		05/04/10 21:09	74-83-9	
2-Butanone (MEK)	ND	ug/L	100	0.96	1		05/04/10 21:09	78-93-3	
Carbon disulfide	ND	ug/L	100	1.2	1		05/04/10 21:09	75-15-0	
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		05/04/10 21:09	56-23-5	
Chlorobenzene	ND	ug/L	3.0	0.23	1		05/04/10 21:09	108-90-7	
Chloroethane	ND	ug/L	10.0	0.54	1		05/04/10 21:09	75-00-3	
Chloroform	ND	ug/L	5.0	0.14	1		05/04/10 21:09	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		05/04/10 21:09	74-87-3	
1,2-Dibromo-3-chloropropane	ND	ug/L	13.0	2.5	1		05/04/10 21:09	96-12-8	
Dibromochloromethane	ND	ug/L	3.0	0.21	1		05/04/10 21:09	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		05/04/10 21:09	106-93-4	
Dibromomethane	ND	ug/L	10.0	0.21	1		05/04/10 21:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	0.30	1		05/04/10 21:09	95-50-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		05/04/10 21:09	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1.0	1		05/04/10 21:09	110-57-6	
1,1-Dichloroethane	ND	ug/L	5.0	0.32	1		05/04/10 21:09	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.12	1		05/04/10 21:09	107-06-2	
1,2-Dichloroethene (Total)	ND	ug/L	5.0	0.49	1		05/04/10 21:09	540-59-0	
1,1-Dichloroethene	ND	ug/L	5.0	0.56	1		05/04/10 21:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	0.19	1		05/04/10 21:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	0.49	1		05/04/10 21:09	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		05/04/10 21:09	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		05/04/10 21:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		05/04/10 21:09	10061-02-6	
Ethylbenzene	ND	ug/L	1.0	0.30	1		05/04/10 21:09	100-41-4	
2-Hexanone	ND	ug/L	50.0	0.46	1		05/04/10 21:09	591-78-6	
Iodomethane	ND	ug/L	10.0	0.32	1		05/04/10 21:09	74-88-4	
Methylene Chloride	ND	ug/L	2.0	0.97	1		05/04/10 21:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	100	0.33	1		05/04/10 21:09	108-10-1	
Styrene	ND	ug/L	1.0	0.26	1		05/04/10 21:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	0.33	1		05/04/10 21:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	3.0	0.40	1		05/04/10 21:09	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		05/04/10 21:09	127-18-4	
Toluene	ND	ug/L	1.0	0.26	1		05/04/10 21:09	108-88-3	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		05/04/10 21:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		05/04/10 21:09	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		05/04/10 21:09	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		05/04/10 21:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		05/04/10 21:09	96-18-4	
Vinyl acetate	ND	ug/L	50.0	0.35	1		05/04/10 21:09	108-05-4	

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ANALYTICAL RESULTS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Sample: 0105-TRIP BLANK **Lab ID: 9268301011** Collected: 04/27/10 00:00 Received: 04/28/10 15:40 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
Vinyl chloride	ND	ug/L	1.0	0.62	1		05/04/10 21:09	75-01-4	
Xylene (Total)	ND	ug/L	2.0	0.66	1		05/04/10 21:09	1330-20-7	
m&p-Xylene	ND	ug/L	2.0	0.66	1		05/04/10 21:09	179601-23-1	
o-Xylene	ND	ug/L	1.0	0.23	1		05/04/10 21:09	95-47-6	
4-Bromofluorobenzene (S)	98	%	87-109		1		05/04/10 21:09	460-00-4	
Dibromofluoromethane (S)	103	%	85-115		1		05/04/10 21:09	1868-53-7	
1,2-Dichloroethane-d4 (S)	102	%	79-120		1		05/04/10 21:09	17060-07-0	
Toluene-d8 (S)	100	%	70-120		1		05/04/10 21:09	2037-26-5	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: MPRP/6278 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

METHOD BLANK: 438214 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	6.0	05/10/10 20:45	
Arsenic	ug/L	ND	10.0	05/10/10 20:45	
Barium	ug/L	ND	100	05/10/10 20:45	
Beryllium	ug/L	ND	1.0	05/10/10 20:45	
Cadmium	ug/L	ND	1.0	05/10/10 20:45	
Chromium	ug/L	ND	10.0	05/10/10 20:45	
Cobalt	ug/L	ND	10.0	05/10/10 20:45	
Copper	ug/L	ND	10.0	05/10/10 20:45	
Iron	ug/L	ND	300	05/10/10 20:45	
Lead	ug/L	ND	10.0	05/10/10 20:45	
Manganese	ug/L	ND	50.0	05/10/10 20:45	
Nickel	ug/L	ND	50.0	05/10/10 20:45	
Selenium	ug/L	ND	10.0	05/10/10 20:45	
Silver	ug/L	ND	10.0	05/10/10 20:45	
Thallium	ug/L	3.0J	5.5	05/10/10 20:45	
Vanadium	ug/L	ND	25.0	05/10/10 20:45	
Zinc	ug/L	ND	10.0	05/10/10 20:45	

LABORATORY CONTROL SAMPLE: 438215

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	521	104	80-120	
Arsenic	ug/L	500	498	100	80-120	
Barium	ug/L	500	498	100	80-120	
Beryllium	ug/L	500	511	102	80-120	
Cadmium	ug/L	500	501	100	80-120	
Chromium	ug/L	500	502	100	80-120	
Cobalt	ug/L	500	507	101	80-120	
Copper	ug/L	500	494	99	80-120	
Iron	ug/L	5000	5280	106	80-120	
Lead	ug/L	500	498	100	80-120	
Manganese	ug/L	500	503	101	80-120	
Nickel	ug/L	500	501	100	80-120	
Selenium	ug/L	500	488	98	80-120	
Silver	ug/L	250	224	90	80-120	
Thallium	ug/L	500	470	94	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	505	101	80-120	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 438216 438217

Parameter	Units	9268301001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	501	511	100	102	75-125	2	25	
Arsenic	ug/L	ND	500	500	507	515	101	103	75-125	2	25	
Barium	ug/L	54.9J	500	500	560	567	101	102	75-125	1	25	
Beryllium	ug/L	0.38J	500	500	520	529	104	106	75-125	2	25	
Cadmium	ug/L	ND	500	500	501	509	100	102	75-125	2	25	
Chromium	ug/L	14.2	500	500	518	528	101	103	75-125	2	25	
Cobalt	ug/L	ND	500	500	499	508	100	102	75-125	2	25	
Copper	ug/L	9.4J	500	500	526	534	103	105	75-125	2	25	
Iron	ug/L	10900	5000	5000	17200	17200	128	127	75-125	0	25	M0
Lead	ug/L	ND	500	500	490	497	97	99	75-125	1	25	
Manganese	ug/L	99.6	500	500	606	615	101	103	75-125	1	25	
Nickel	ug/L	11.7J	500	500	511	519	100	101	75-125	2	25	
Selenium	ug/L	ND	500	500	506	507	101	101	75-125	0	25	
Silver	ug/L	0.20J	250	250	226	229	90	92	75-125	1	25	
Thallium	ug/L	4.5J	500	500	469	482	93	96	75-125	3	25	
Vanadium	ug/L	19.6J	500	500	537	546	103	105	75-125	2	25	
Zinc	ug/L	23.2	500	500	530	539	101	103	75-125	2	25	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: MERP/2794 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

METHOD BLANK: 435639 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	05/04/10 12:03	

LABORATORY CONTROL SAMPLE: 435640

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 435641 435642

Parameter	Units	9268301001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.4	2.4	96	94	75-125	2	25	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: MSV/10817 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010, 9268301011

METHOD BLANK: 436757 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010, 9268301011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	5.0	05/04/10 13:09	
1,1,1-Trichloroethane	ug/L	ND	1.0	05/04/10 13:09	
1,1,2,2-Tetrachloroethane	ug/L	ND	3.0	05/04/10 13:09	
1,1,2-Trichloroethane	ug/L	ND	1.0	05/04/10 13:09	
1,1-Dichloroethane	ug/L	ND	5.0	05/04/10 13:09	
1,1-Dichloroethene	ug/L	ND	5.0	05/04/10 13:09	
1,2,3-Trichloropropane	ug/L	ND	1.0	05/04/10 13:09	
1,2-Dibromo-3-chloropropane	ug/L	ND	13.0	05/04/10 13:09	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	05/04/10 13:09	
1,2-Dichlorobenzene	ug/L	ND	5.0	05/04/10 13:09	
1,2-Dichloroethane	ug/L	ND	1.0	05/04/10 13:09	
1,2-Dichloroethene (Total)	ug/L	ND	5.0	05/04/10 13:09	
1,2-Dichloropropane	ug/L	ND	1.0	05/04/10 13:09	
1,4-Dichlorobenzene	ug/L	ND	1.0	05/04/10 13:09	
2-Butanone (MEK)	ug/L	ND	100	05/04/10 13:09	
2-Hexanone	ug/L	ND	50.0	05/04/10 13:09	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	05/04/10 13:09	
Acetone	ug/L	ND	100	05/04/10 13:09	
Acrylonitrile	ug/L	ND	200	05/04/10 13:09	
Benzene	ug/L	ND	1.0	05/04/10 13:09	
Bromochloromethane	ug/L	ND	3.0	05/04/10 13:09	
Bromodichloromethane	ug/L	ND	1.0	05/04/10 13:09	
Bromoform	ug/L	ND	3.0	05/04/10 13:09	
Bromomethane	ug/L	ND	10.0	05/04/10 13:09	
Carbon disulfide	ug/L	ND	100	05/04/10 13:09	
Carbon tetrachloride	ug/L	ND	1.0	05/04/10 13:09	
Chlorobenzene	ug/L	ND	3.0	05/04/10 13:09	
Chloroethane	ug/L	ND	10.0	05/04/10 13:09	
Chloroform	ug/L	ND	5.0	05/04/10 13:09	
Chloromethane	ug/L	ND	1.0	05/04/10 13:09	
cis-1,2-Dichloroethene	ug/L	ND	5.0	05/04/10 13:09	
cis-1,3-Dichloropropene	ug/L	ND	1.0	05/04/10 13:09	
Dibromochloromethane	ug/L	ND	3.0	05/04/10 13:09	
Dibromomethane	ug/L	ND	10.0	05/04/10 13:09	
Ethylbenzene	ug/L	ND	1.0	05/04/10 13:09	
Iodomethane	ug/L	ND	10.0	05/04/10 13:09	
m&p-Xylene	ug/L	ND	2.0	05/04/10 13:09	
Methylene Chloride	ug/L	2.6	2.0	05/04/10 13:09	C9
o-Xylene	ug/L	ND	1.0	05/04/10 13:09	
Styrene	ug/L	ND	1.0	05/04/10 13:09	
Tetrachloroethene	ug/L	ND	1.0	05/04/10 13:09	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

METHOD BLANK: 436757 Matrix: Water

Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010, 9268301011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Toluene	ug/L	ND	1.0	05/04/10 13:09	
trans-1,2-Dichloroethene	ug/L	ND	5.0	05/04/10 13:09	
trans-1,3-Dichloropropene	ug/L	ND	1.0	05/04/10 13:09	
trans-1,4-Dichloro-2-butene	ug/L	ND	100	05/04/10 13:09	
Trichloroethene	ug/L	ND	1.0	05/04/10 13:09	
Trichlorofluoromethane	ug/L	ND	1.0	05/04/10 13:09	
Vinyl acetate	ug/L	ND	50.0	05/04/10 13:09	
Vinyl chloride	ug/L	ND	1.0	05/04/10 13:09	
Xylene (Total)	ug/L	ND	2.0	05/04/10 13:09	
1,2-Dichloroethane-d4 (S)	%	98	79-120	05/04/10 13:09	
4-Bromofluorobenzene (S)	%	98	87-109	05/04/10 13:09	
Dibromofluoromethane (S)	%	101	85-115	05/04/10 13:09	
Toluene-d8 (S)	%	100	70-120	05/04/10 13:09	

LABORATORY CONTROL SAMPLE: 436758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	54.4	109	83-125	
1,1,1-Trichloroethane	ug/L	50	53.3	107	80-129	
1,1,2,2-Tetrachloroethane	ug/L	50	57.5	115	73-127	
1,1,2-Trichloroethane	ug/L	50	55.9	112	77-123	
1,1-Dichloroethane	ug/L	50	54.4	109	76-129	
1,1-Dichloroethene	ug/L	50	51.4	103	78-146	
1,2,3-Trichloropropane	ug/L	50	54.7	109	72-125	
1,2-Dibromo-3-chloropropane	ug/L	50	57.5	115	65-128	
1,2-Dibromoethane (EDB)	ug/L	50	47.2	94	81-125	
1,2-Dichlorobenzene	ug/L	50	54.1	108	82-126	
1,2-Dichloroethane	ug/L	50	55.3	111	72-126	
1,2-Dichloroethene (Total)	ug/L	100	95.8	96	50-150	
1,2-Dichloropropane	ug/L	50	49.9	100	80-127	
1,4-Dichlorobenzene	ug/L	50	53.0	106	79-125	
2-Butanone (MEK)	ug/L	100	115	115	50-134	
2-Hexanone	ug/L	100	114	114	58-138	
4-Methyl-2-pentanone (MIBK)	ug/L	100	114	114	70-131	
Acetone	ug/L	100	109	109	50-146	
Acrylonitrile	ug/L	250	296	118	66-124	
Benzene	ug/L	50	50.4	101	78-128	
Bromochloromethane	ug/L	50	52.6	105	73-124	
Bromodichloromethane	ug/L	50	53.3	107	81-125	
Bromoform	ug/L	50	48.0	96	71-125	
Bromomethane	ug/L	50	54.8	110	50-150	
Carbon disulfide	ug/L	50	47.6J	95	54-150	
Carbon tetrachloride	ug/L	50	60.5	121	81-137	
Chlorobenzene	ug/L	50	52.0	104	82-126	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

LABORATORY CONTROL SAMPLE: 436758

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloroethane	ug/L	50	48.6	97	69-140	
Chloroform	ug/L	50	53.9	108	77-129	
Chloromethane	ug/L	50	51.1	102	54-139	
cis-1,2-Dichloroethene	ug/L	50	44.6	89	76-133	
cis-1,3-Dichloropropene	ug/L	50	45.3	91	76-127	
Dibromochloromethane	ug/L	50	52.6	105	77-125	
Dibromomethane	ug/L	50	49.2	98	77-125	
Ethylbenzene	ug/L	50	51.9	104	80-127	
Iodomethane	ug/L	100	98.4	98	65-172	
m&p-Xylene	ug/L	100	108	108	82-127	
Methylene Chloride	ug/L	50	48.4	97	67-133	
o-Xylene	ug/L	50	53.1	106	83-124	
Styrene	ug/L	50	53.6	107	80-130	
Tetrachloroethene	ug/L	50	52.3	105	78-128	
Toluene	ug/L	50	51.9	104	76-126	
trans-1,2-Dichloroethene	ug/L	50	51.3	103	78-134	
trans-1,3-Dichloropropene	ug/L	50	45.7	91	75-125	
trans-1,4-Dichloro-2-butene	ug/L	50	49.5J	99	51-140	
Trichloroethene	ug/L	50	53.7	107	79-127	
Trichlorofluoromethane	ug/L	50	47.1	94	76-148	
Vinyl acetate	ug/L	100	110	110	50-150	
Vinyl chloride	ug/L	50	47.2	94	67-143	
Xylene (Total)	ug/L	150	161	107	83-125	
1,2-Dichloroethane-d4 (S)	%			104	79-120	
4-Bromofluorobenzene (S)	%			101	87-109	
Dibromofluoromethane (S)	%			96	85-115	
Toluene-d8 (S)	%			99	70-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 436761 436762

Parameter	Units	9268301001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1-Dichloroethene	ug/L	ND	50	50	31.9	47.4	64	95	60-150	39	30	R1
Benzene	ug/L	ND	50	50	30.8	46.2	62	92	74-136	40	30	M0,R1
Chlorobenzene	ug/L	ND	50	50	31.1	46.9	62	94	79-135	41	30	M0,R1
Toluene	ug/L	ND	50	50	31.6	47.5	63	95	73-131	40	30	M0,R1
Trichloroethene	ug/L	ND	50	50	32.3	49.1	65	98	73-131	41	30	M0,R1
1,2-Dichloroethane-d4 (S)	%						101	100	79-120			
4-Bromofluorobenzene (S)	%						99	99	87-109			
Dibromofluoromethane (S)	%						103	101	85-115			
Toluene-d8 (S)	%						99	99	70-120			

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(704)875-9092

QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: WET/12234 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 9268301001, 9268301002

METHOD BLANK: 435725 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	04/30/10 13:37	

LABORATORY CONTROL SAMPLE: 435726

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	46.7	93	90-110	

SAMPLE DUPLICATE: 435728

Parameter	Units	9268301001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	18.7	18.7	0	20	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: WET/12256 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

METHOD BLANK: 436528 Matrix: Water
Associated Lab Samples: 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	05/03/10 16:09	

LABORATORY CONTROL SAMPLE: 436529

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	45.6	91	90-110	

SAMPLE DUPLICATE: 436530

Parameter	Units	9268301003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	8.2	8.2	0	20	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: WET/12247 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

METHOD BLANK: 436236 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	20.0	04/30/10 22:36	

LABORATORY CONTROL SAMPLE: 436237

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	214	86	80-120	

SAMPLE DUPLICATE: 436238

Parameter	Units	9268229001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2020	2110	5	20	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: WETA/7285 Analysis Method: SM 4500-Cl-E
QC Batch Method: SM 4500-Cl-E Analysis Description: 4500 Chloride
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

METHOD BLANK: 436674 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	5.0	05/04/10 10:09	

LABORATORY CONTROL SAMPLE: 436675

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.0	105	90-110	

MATRIX SPIKE SAMPLE: 436677

Parameter	Units	9268301001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	ND	20	25.1	101	75-125	

SAMPLE DUPLICATE: 436676

Parameter	Units	9268301001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	ND	ND		20	

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QUALITY CONTROL DATA

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

QC Batch: WETA/7344 Analysis Method: ASTM D516-90
QC Batch Method: ASTM D516-90 Analysis Description: ASTM D516-90 Sulfate Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

METHOD BLANK: 440390 Matrix: Water
Associated Lab Samples: 9268301001, 9268301002, 9268301003, 9268301004, 9268301005, 9268301006, 9268301007, 9268301008, 9268301009, 9268301010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	250	05/11/10 23:46	

LABORATORY CONTROL SAMPLE: 440391

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	18.4J	92	90-110	

MATRIX SPIKE SAMPLE: 440392

Parameter	Units	9268135002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	14.2	20	32.3J	90	75-125	

MATRIX SPIKE SAMPLE: 440394

Parameter	Units	9268301001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	11.8J	20	32.9J	106	75-125	

SAMPLE DUPLICATE: 440393

Parameter	Units	9268135002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	14.2	14.2J	0	20	

SAMPLE DUPLICATE: 440395

Parameter	Units	9268301001 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfate	mg/L	11.8J	12.6J	7	20	

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QUALIFIERS

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

ANALYTE QUALIFIERS

C9	Common Laboratory Contaminant.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
9268301001	**0105-MW2 MS/MSD**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301002	**0105-MW4**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301003	**0105-MW6**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301004	**0105-MW7**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301005	**0105-MW8**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301006	**0105-MW10S**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301007	**0105-P19S**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301008	**0105-SW1**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301009	**0105-SW2**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301010	**0105-FIELD BLANK**	EPA 3010	MPRP/6278	EPA 6010	ICP/5790
9268301001	**0105-MW2 MS/MSD**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301002	**0105-MW4**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301003	**0105-MW6**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301004	**0105-MW7**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301005	**0105-MW8**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301006	**0105-MW10S**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301007	**0105-P19S**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301008	**0105-SW1**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301009	**0105-SW2**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301010	**0105-FIELD BLANK**	EPA 7470	MERP/2794	EPA 7470	MERC/2759
9268301001	**0105-MW2 MS/MSD**	EPA 8260	MSV/10817		
9268301002	**0105-MW4**	EPA 8260	MSV/10817		
9268301003	**0105-MW6**	EPA 8260	MSV/10817		
9268301004	**0105-MW7**	EPA 8260	MSV/10817		
9268301005	**0105-MW8**	EPA 8260	MSV/10817		
9268301006	**0105-MW10S**	EPA 8260	MSV/10817		
9268301007	**0105-P19S**	EPA 8260	MSV/10817		
9268301008	**0105-SW1**	EPA 8260	MSV/10817		
9268301009	**0105-SW2**	EPA 8260	MSV/10817		
9268301010	**0105-FIELD BLANK**	EPA 8260	MSV/10817		
9268301011	**0105-TRIP BLANK**	EPA 8260	MSV/10817		
9268301001	**0105-MW2 MS/MSD**	SM 2320B	WET/12234		
9268301002	**0105-MW4**	SM 2320B	WET/12234		
9268301003	**0105-MW6**	SM 2320B	WET/12256		
9268301004	**0105-MW7**	SM 2320B	WET/12256		
9268301005	**0105-MW8**	SM 2320B	WET/12256		
9268301006	**0105-MW10S**	SM 2320B	WET/12256		
9268301007	**0105-P19S**	SM 2320B	WET/12256		
9268301008	**0105-SW1**	SM 2320B	WET/12256		
9268301009	**0105-SW2**	SM 2320B	WET/12256		
9268301010	**0105-FIELD BLANK**	SM 2320B	WET/12256		
9268301001	**0105-MW2 MS/MSD**	SM 2540C	WET/12247		
9268301002	**0105-MW4**	SM 2540C	WET/12247		
9268301003	**0105-MW6**	SM 2540C	WET/12247		
9268301004	**0105-MW7**	SM 2540C	WET/12247		
9268301005	**0105-MW8**	SM 2540C	WET/12247		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: COBLE SANDROCK 419.1000.12.01
Pace Project No.: 9268301

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
9268301006	**0105-MW10S**	SM 2540C	WET/12247		
9268301007	**0105-P19S**	SM 2540C	WET/12247		
9268301008	**0105-SW1**	SM 2540C	WET/12247		
9268301009	**0105-SW2**	SM 2540C	WET/12247		
9268301010	**0105-FIELD BLANK**	SM 2540C	WET/12247		
9268301001	**0105-MW2 MS/MSD**	SM 4500-Cl-E	WETA/7285		
9268301002	**0105-MW4**	SM 4500-Cl-E	WETA/7285		
9268301003	**0105-MW6**	SM 4500-Cl-E	WETA/7285		
9268301004	**0105-MW7**	SM 4500-Cl-E	WETA/7285		
9268301005	**0105-MW8**	SM 4500-Cl-E	WETA/7285		
9268301006	**0105-MW10S**	SM 4500-Cl-E	WETA/7285		
9268301007	**0105-P19S**	SM 4500-Cl-E	WETA/7285		
9268301008	**0105-SW1**	SM 4500-Cl-E	WETA/7285		
9268301009	**0105-SW2**	SM 4500-Cl-E	WETA/7285		
9268301010	**0105-FIELD BLANK**	SM 4500-Cl-E	WETA/7285		
9268301001	**0105-MW2 MS/MSD**	ASTM D516-90	WETA/7344		
9268301002	**0105-MW4**	ASTM D516-90	WETA/7344		
9268301003	**0105-MW6**	ASTM D516-90	WETA/7344		
9268301004	**0105-MW7**	ASTM D516-90	WETA/7344		
9268301005	**0105-MW8**	ASTM D516-90	WETA/7344		
9268301006	**0105-MW10S**	ASTM D516-90	WETA/7344		
9268301007	**0105-P19S**	ASTM D516-90	WETA/7344		
9268301008	**0105-SW1**	ASTM D516-90	WETA/7344		
9268301009	**0105-SW2**	ASTM D516-90	WETA/7344		
9268301010	**0105-FIELD BLANK**	ASTM D516-90	WETA/7344		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1181182

Section A Required Client Information:

Company: Joyce Engineering, Inc.
Address: 2211 W. Meadowview Rd Ste 101, Greensboro, NC 27407
Email To: jkerly@joyceengineering.com
Phone: 336-323-0092 Fax: 336-323-0093
Requested Due Date/TAT: 10

Section B Required Project Information:

Report To: Jeremey Kerly
Copy To:
Purchase Order No.:
Project Name: ~~40~~ Coble Sandrock
Project Number: RW ~~419-0905-A-34~~ 419.1000.12.01

Section C Invoice Information:

Attention: Lecia Jones
Company Name: JEI
Address: 1604 Ownby Ln. Richmond, VA 23222
Pace Quote Reference:
Pace Project Manager: Kevin Godwin
Pace Profile #: 2186-12

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: NC Appl Metals	NC Appl 8260	Mercury	Chloride	Manganese	Sulfate	Iron	Alkalinity	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 4268301
1	0105-MW2 MS/MSD	WT	G			4/27/10	10:40		24	X		X	X					X	X	X	X	X	X	X	X	X		001
2	0105-MW4						11:00		8	X		X	X					X	X	X	X	X	X	X	X	X		002
3	0105-MW6						9:05		8	X		X	X					X	X	X	X	X	X	X	X	X		003
4	0105-MW7						11:25		8	X		X	X					X	X	X	X	X	X	X	X	X		004
5	0105-MW8						10:15		8	X		X	X					X	X	X	X	X	X	X	X	X		005
6	0105-MW106						9:30		8	X		X	X					X	X	X	X	X	X	X	X	X		006
7	0105-P19S						9:45		8	X		X	X					X	X	X	X	X	X	X	X	X		007
8	0105-SW1						11:15		8	X		X	X					X	X	X	X	X	X	X	X	X		008
9	0105-SW2						10:00		8	X		X	X					X	X	X	X	X	X	X	X	X		009
10	0105-Field Blank						11:40		8	X		X	X					X	X	X	X	X	X	X	X	X		010
11	0105-Trip Blank						—		4				X						X									011
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	[signature] / JEI	4/28/10	11:50	[signature] Pace	4/28/10	1150
	[signature]	4/28/10	1540	[signature] Pace	4/28/10	1540

SAMPLE CONDITIONS

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
40	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Robert L Winfield, Daniel Girdner

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 4/27/10

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

DATE: 4/26-27/10

JOYCE ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-MW2 **Sampler(s):** R. Winfield/D. Girdner

Well Location: near top of hill; west side of LF

Well Diameter: 2 inches

Initial Depth to Water (DTW): 4.08 feet

Depth to Bottom (DTB): 22.98 feet

Water Column Thickness (WCT): 18.90 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 3.08 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 9.24 gallons

Actual Amount Purged/Bailed : 6.25 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 14.26 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	12:17	14.6	5.94	78.1	>1000	DG
3.08	12:20	14.1	5.86	76.3	>1000	DG
6.16	12:25	14.8	5.50	68.9	>1000	DG
Dry @ 6.25	—					DG
	4/27/10					
Before Sampling	10:40	14.0	5.99	60.8	>1000	DG

Comments (weather conditions, odor, color, silt, etc.):

4/26-Mostly sunny, increasing clouds, 70's

4/27-Partly cloudy, 60's

Signature: Daniel A Girdner **Date:** 4/27/10

QA/QC Sign Off: [illegible] **Date:** 5-5-10

DATE: 4/26-27/10

JOYCE ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-MW4 **Sampler(s):** R. Winfield/D. Girdner

Well Location: between MW-5 and MW-2

Well Diameter: 2 inches

Initial Depth to Water (DTW): 14.37 feet

Depth to Bottom (DTB): 24.22 feet

Water Column Thickness (WCT): 9.85 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 1.61 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 4.82 gallons

Actual Amount Purged/Bailed : 4.82 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 14.52 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	12:34	15.2	5.28	91.1	42.4	RW
1.61	12:37	14.8	5.26	67.9	>1000	RW
3.22	12:40	14.8	5.29	157.0	>1000	RW
4.82	12:42	15.2	5.20	428	>1000	RW
	4/27/10					
Before Sampling	11:00	14.9	5.39	529	15.5	RW

Comments (weather conditions, odor, color, silt, etc.):

4/26-Mostly sunny, 70's

4/27-Partly cloudy, 60's

Signature: [signature] **Date:** 4/27/10

QA/QC Sign Off: [signature] **Date:** 5-5-10

DATE: 4/26-27/10

ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-MW6 **Sampler(s):** R. Winfield/D. Girdner

Well Location: flush mount in field that is fenced before the fill area (former P-3)

Well Diameter: 2 inches

Initial Depth to Water (DTW): 21.05 feet

Depth to Bottom (DTB): 41.00 feet

Water Column Thickness (WCT): 19.95 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 3.25 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 9.75 gallons

Actual Amount Purged/Bailed : 9.75 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 21.26 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	10:35	16.4	5.88	132.8	12.8	DG
3.25	10:38	16.7	5.27	138.3	>1000	DG
6.50	10:43	16.3	5.15	125.9	>1000	DG
9.75	10:46	16.1	5.19	142.9	>1000	DG
	4/27/10					
Before Sampling	9:05	16.2	5.31	123.1	6.61	DG

Comments (weather conditions, odor, color, silt, etc.):

4/26-Mostly sunny, 70's

4/27-Sunny, breezy, cool 54°F

Signature: Daniel S. Girdner **Date:** 4/27/10

QA/QC Sign Off: [illegible] **Date:** 5-5-10

DATE: 4/26-27/10

ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-MW7 **Sampler(s):** R. Winfield/D. Girdner

Well Location: Westside of the landfill near MW5

Well Diameter: 2 inches

Initial Depth to Water (DTW): 8.76 feet

Depth to Bottom (DTB): 16.00 feet

Water Column Thickness (WCT): 7.24 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 1.18 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 3.54 gallons

Actual Amount Purged/Bailed : 3.54 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: - feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	12:55	19.8	6.05	1185	119	DG
1.18	12:56	19.7	6.21	1354	>1000	DG
2.36	12:58	19.6	6.20	1244	>1000	DG
3.54	13:00	19.5	6.29	1291	>1000	DG
	4/27/10					
Before Sampling	11:25	18.9	6.24	1388	2.02	DG

Comments (weather conditions, odor, color, silt, etc.): odor, bubbles

4/26-Partly cloudy, 70's

4/27-Partly cloudy, 60's

Field Blank @ 11:40 4/27/10

Signature: Daniel J. Girdner **Date:** 4/27/10

QA/QC Sign Off: [illegible] **Date:** 5-5-10

DATE: 04/26-27/10

JOYCE ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-MW8 **Sampler(s):** R. Winfield/ D. Girdner

Well Location: backside of the landfill along perimeter road

Well Diameter: 2 inches

Initial Depth to Water (DTW): 6.32 feet

Depth to Bottom (DTB): 22.76 feet

Water Column Thickness (WCT): 16.44 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 2.68 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 8.04 gallons

Actual Amount Purged/Bailed : 8.04 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 6.47 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	11:55	14.6	5.93	104.7	57.2	RW
2.68	11:58	14.0	6.13	102.8	>1000	RW
5.36	12:01	14.0	6.20	102.3	>1000	RW
8.04	12:04	13.9	6.27	102.1	>1000	RW
	4/27/10					
Before Sampling	10:15	14.2	6.44	104.1	361	RW

Comments (weather conditions, odor, color, silt, etc.):

4/26-Mostly sunny, 70's

4/27-Mostly sunny, 60's

Signature: [signature] **Date:** 4/27/10

QA/QC Sign Off: [signature] **Date:** 5-5-10

DATE: 4/26-27/10

ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-MW10S **Sampler(s):** D. Girdner/R. Winfield

Well Location: side of the landfill along perimeter road

Well Diameter: 2 inches

Initial Depth to Water (DTW): 8.36 feet

Depth to Bottom (DTB): 24.34 feet

Water Column Thickness (WCT): 15.98 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 2.60 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 7.81 gallons

Actual Amount Purged/Bailed : 7.81 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 8.42 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	11:06	13.6	5.69	196.0	16.5	RW
2.60	11:09	13.0	5.85	178.4	793	RW
5.20	11:12	12.6	5.83	182.7	701	RW
7.81	11:15	12.7	5.84	169.0	>1000	RW
	4/27/10					
Before Sampling	9:30	12.8	5.58	178.2	96.8	RW

Comments (weather conditions, odor, color, silt, etc.):

4/26-Mostly sunny, 70's

4/27-Mostly sunny, 50's

Signature: R. Winfield **Date:** 4/27/10

QA/QC Sign Off: [illegible] **Date:** 5-5-10

DATE: 4/26-27/10

ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.01

Well ID: 0105-P19S **Sampler(s):** D. Girdner/R. Winfield

Well Location: backside of the landfill towards bridge in the woods

Well Diameter: 2 inches

Initial Depth to Water (DTW): 4.96 feet

Depth to Bottom (DTB): 13.00 feet

Water Column Thickness (WCT): 8.04 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 1.31 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 3.94 gallons

Actual Amount Purged/Bailed : 4.00 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 5.10 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	11:33	13.8	5.68	129.0	277	DG
1.31	11:35	13.1	5.66	134.3	>1000	DG
2.62	11:36	13.0	5.62	134.9	643	DG
3.93	11:36	12.8	5.61	138.2	578	DG
	4/27/10					
Before Sampling	9:45	13.5	5.92	135.2	6.86	DG

Comments (weather conditions, odor, color, silt, etc.):

4/26-Mostly sunny, 70's

4/27-Sunny, breezy, 50's-60's

Red algae in 1st well volume

Signature: Daniel J Girdner **Date:** 4/27/10

QA/QC Sign Off: [illegible] **Date:** 5-5-10

DATE: 4/27/10

ENGINEERING, INC.

SURFACE WATER MONITORING LOG

Project Name: COBLE'S SANDROCK LF **Project/Task No.:** 419.1000.12.01

Surface Point ID: 0105-SW1 **Sampler(s):** R. Winfield/D. Girdner

Location: Stream near MW4

Field Parameters:

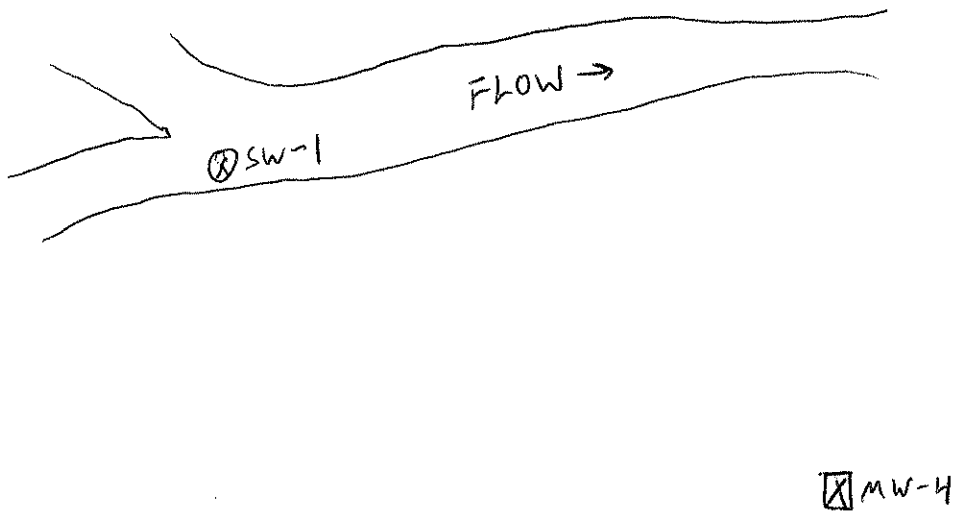
Time of Sampling:	11:15	
pH:	6.39	
Temperature :	16.9	(°C)
Conductivity :	115.7	(µS)
Turbidity :	8.78	(ntu)

Comments/Sample Description(weather conditions, odor, color, silt, etc.):

Partly cloudy, 60's

Not much flow in stream

Sketch of Sample Location (include flow direction, drainage pathways, etc.):



Signature: R. Winfield **Date:** 4/27/10

QA/QC Sign Off: [illegible] **Date:** 5-5-10

DATE: 4/27/10

JOYCE ENGINEERING, INC.

SURFACE WATER MONITORING LOG

Project Name: COBLE'S SANDROCK LF **Project/Task No.:** 419.1000.12.01

Surface Point ID: 0105-SW2 **Sampler(s):** R. Winfield/D. Girdner

Location: off bridge in woods

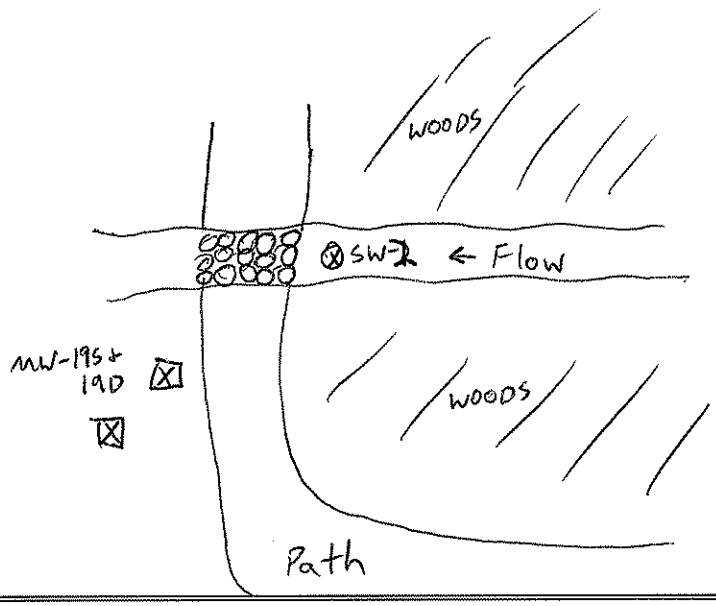
Field Parameters:

Time of Sampling:	10:00	
pH:	6.19	
Temperature :	14.0	**(°C)**
Conductivity :	198	**(µS)**
Turbidity :	5.20	**(ntu)**

Comments/Sample Description(weather conditions, odor, color, silt, etc.):

Sunny, 60's

Sketch of Sample Location (include flow direction, drainage pathways, etc.):



Signature: R. Winfield **Date:** 4/27/10

QA/QC Sign Off: KF **Date:** 5-5-10

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June 30, 2010

Mr. Jeremey Kerly
Joyce Engineering-NC
2211 West Meadowview Rd
Suite 101
Greensboro, NC 27407

RE: Project: 419.0900.02
Pace Project No.: 9271633

Dear Mr. Kerly:
Enclosed are the analytical results for sample(s) received by the laboratory on June 16, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Huntersville laboratory unless otherwise footnoted. All Microbiological analyses were performed at the laboratory where the samples were received.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin

kevin.godwin@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: 419.0900.02
Pace Project No.: 9271633

Asheville Certification IDs
2225 Riverside Dr. Asheville, NC 28804
Connecticut Certification #: PH-0106
Florida/NELAP Certification #: E87648
Louisiana/LELAP Certification #: 03095
Massachusetts Certification #: M-NC030
New Jersey Certification #: NC011
North Carolina Bioassay Certification #: 9
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
Pennsylvania Certification #: 68-03578
South Carolina Bioassay Certification #: 9903002
South Carolina Certification #: 9903001
Tennessee Certification #: 2980
Virginia Certification #: 00072
West Virginia Certification #: 356

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SAMPLE SUMMARY

Project: 419.0900.02
Pace Project No.: 9271633

Lab ID	Sample ID	Matrix	Date Collected	Date Received
9271633001	**0105-MW2**	Water	06/15/10 13:55	06/16/10 16:25
9271633002	**0105-MW4**	Water	06/15/10 14:00	06/16/10 16:25
9271633003	**0105-MW7**	Water	06/15/10 14:15	06/16/10 16:25
9271633004	**0105-FIELD BLANK**	Water	06/15/10 14:20	06/16/10 16:25

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SAMPLE ANALYTE COUNT

Project: 419.0900.02
Pace Project No.: 9271633

Lab ID	Sample ID	Method	Analysts	Analytes Reported
9271633001	**0105-MW2**	EPA 6010	JMW	3
9271633002	**0105-MW4**	EPA 6010	JMW	2
		SM 2540C	MLM	1
9271633003	**0105-MW7**	EPA 6010	JMW	2
		SM 2540C	MLM	1
9271633004	**0105-FIELD BLANK**	EPA 6010	JMW	3

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ANALYTICAL RESULTS

Project: 419.0900.02
Pace Project No.: 9271633

Sample: 0105-MW2 **Lab ID: 9271633001** Collected: 06/15/10 13:55 Received: 06/16/10 16:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Chromium	**4.0J**	ug/L	10.0	0.40	1	06/21/10 11:30	06/23/10 23:59	7440-47-3	
Iron	**2910**	ug/L	300	14.0	1	06/21/10 11:30	06/23/10 23:59	7439-89-6	
Manganese	**29.3J**	ug/L	50.0	0.30	1	06/21/10 11:30	06/23/10 23:59	7439-96-5	

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ANALYTICAL RESULTS

Project: 419.0900.02
Pace Project No.: 9271633

Sample: 0105-MW4 **Lab ID: 9271633002** Collected: 06/15/10 14:00 Received: 06/16/10 16:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Iron	**887**	ug/L	300	14.0	1	06/21/10 11:30	06/24/10 00:02	7439-89-6	
Manganese	**914**	ug/L	50.0	0.30	1	06/21/10 11:30	06/24/10 00:02	7439-96-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**696**	mg/L	100	100	1		06/17/10 17:47		

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ANALYTICAL RESULTS

Project: 419.0900.02
Pace Project No.: 9271633

Sample: 0105-MW7 **Lab ID: 9271633003** Collected: 06/15/10 14:15 Received: 06/16/10 16:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Iron	**13000**	ug/L	300	14.0	1	06/21/10 11:30	06/24/10 00:05	7439-89-6	
Manganese	**19900**	ug/L	500	3.0	10	06/21/10 11:30	06/24/10 15:59	7439-96-5	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1560**	mg/L	100	100	1		06/17/10 17:47		

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ANALYTICAL RESULTS

Project: 419.0900.02
Pace Project No.: 9271633

Sample: 0105-FIELD BLANK **Lab ID: 9271633004** Collected: 06/15/10 14:20 Received: 06/16/10 16:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 ICP Groundwater	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Chromium	ND	ug/L	10.0	0.40	1	06/21/10 11:30	06/24/10 00:09	7440-47-3	
Iron	**26.5J**	ug/L	300	14.0	1	06/21/10 11:30	06/24/10 00:09	7439-89-6	
Manganese	**7.4J**	ug/L	50.0	0.30	1	06/21/10 11:30	06/24/10 00:09	7439-96-5	

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QUALITY CONTROL DATA

Project: 419.0900.02
Pace Project No.: 9271633

QC Batch: MPRP/6542 | Analysis Method: EPA 6010
QC Batch Method: EPA 3010 | Analysis Description: 6010 MET NC Groundwater
Associated Lab Samples: 9271633001, 9271633002, 9271633003, 9271633004

METHOD BLANK: 458997 | Matrix: Water
Associated Lab Samples: 9271633001, 9271633002, 9271633003, 9271633004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	ug/L	ND	10.0	06/23/10 23:15	
Iron	ug/L	ND	300	06/23/10 23:15	
Manganese	ug/L	ND	50.0	06/23/10 23:15	

LABORATORY CONTROL SAMPLE: 458998

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	500	490	98	80-120	
Iron	ug/L	5000	4800	96	80-120	
Manganese	ug/L	500	487	97	80-120	

MATRIX SPIKE SAMPLE: 458999

Parameter	Units	9271429016 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	ug/L	0.011 mg/L	500	511	100	75-125	
Iron	ug/L	1280	5000	6130	97	75-125	
Manganese	ug/L	150	500	636	97	75-125	

SAMPLE DUPLICATE: 459000

Parameter	Units	9271429017 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium	ug/L	0.0089 mg/L	8.6J	3	25	
Iron	ug/L	5880	5720	3	25	
Manganese	ug/L	699	681	3	25	

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QUALITY CONTROL DATA

Project: 419.0900.02
Pace Project No.: 9271633

QC Batch: WET/12775
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 9271633002, 9271633003

METHOD BLANK: 457859
Matrix: Water
Associated Lab Samples: 9271633002, 9271633003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	06/17/10 17:45	

LABORATORY CONTROL SAMPLE: 457860

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	242	97	80-120	

SAMPLE DUPLICATE: 457861

Parameter	Units	9271626001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		20	

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QUALIFIERS

Project: 419.0900.02
Pace Project No.: 9271633

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

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(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 419.0900.02
Pace Project No.: 9271633

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
9271633001	**0105-MW2**	EPA 3010	MPRP/6542	EPA 6010	ICP/6038
9271633002	**0105-MW4**	EPA 3010	MPRP/6542	EPA 6010	ICP/6038
9271633003	**0105-MW7**	EPA 3010	MPRP/6542	EPA 6010	ICP/6038
9271633004	**0105-FIELD BLANK**	EPA 3010	MPRP/6542	EPA 6010	ICP/6038
9271633002	**0105-MW4**	SM 2540C	WET/12775		
9271633003	**0105-MW7**	SM 2540C	WET/12775		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A — Required Client Information:

Company:	Joyce Engineering, Inc.
Address:	2211 W. Meadowview Rd. Suite 101
	Greensboro, NC 27407
Email To:	jkerly@joyceengineering.com
Phone:	Fax:
Requested Due Date/TAT:	10 Day (Default)

Section B — Required Project Information:

Report To:	Jeremey Kerly
Copy To:	
Purchase Order No.	
Client Project ID:	419.0900.11.02
Container Order Number:	

Section C — Invoice Information:

Attention:	Lecia Jones
Company Name:	Joyce Engineering
Address:	1604 Ownby Lane, Richmond, VA 23220
Pace Quote Reference:	
Pace Project Manager:	Godwin, Kevin
Pace Profile #:	

Regulatory Agency	
State / Location	North Carolina

Requested Analysis Filtered (Y/N): Y/N

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test: Chromium	Iron	Manganese	TDS	Residual Chlorine (Y/N)	9271633
1	0105-MW2	WT	G			6-15-10	1355		1			X						X	X	X			9271633001
2	0105-MW4	WT	G			6-15-10	1400		2	X		X							X	X	X		002
3	0105-MW7	WT	G			6-15-10	1415		2	X		X							X	X	X		003
4	0105-Field Blank	WT	G			6-15-10	1420		2	X		X						X	X	X	~~X~~		004
5		WT																					
6		WT																					
7		WT																					
8		WT																					
9		WT																					
10		WT																					
11		WT																					
12		WT																					

Matrix codes: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature] JEI	6-16-10	300	[signature] Pace CHLT	6-16-10	1210				
	[signature]	6-16-10	1625	[signature] Pace	6/16/10	16:25	2-4	yes	no	yes

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Jeremey Kerly Robert Winfield		
SIGNATURE of SAMPLER:	[signature]	DATE Signed:	6-15-10

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

DATE: 6/15/10

JOYCE ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.02

Well ID: 0105-MW2 **Sampler(s):** R. Winfield/J. Kerly

Well Location: near top of hill; west side of LF

Well Diameter: 2 inches

Initial Depth to Water (DTW): 14.47 feet

Depth to Bottom (DTB): 22.98 feet

Water Column Thickness (WCT): 8.51 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 1.39 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 4.17 gallons

Actual Amount Purged/Bailed : 4.25 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 14.74 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	9:26	16.0	6.53	119.2	153	JJK
1.39	9:28	14.9	5.35	100.5	535	JJK
2.78	9:30	15.1	5.02	115.3	842	JJK
4.17	9:32	15.1	5.18	116.2	859	JJK
	6/15/10					
Before Sampling	13:55	18.2	6.90	104.8	78.6	JJK

Comments (weather conditions, odor, color, silt, etc.):

Sunny, humid, hot, 80's

Signature: [signature] **Date:** 6-15-10

QA/QC Sign Off: [signature] **Date:** 8-4-10

DATE: 6/15/10

ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.02

Well ID: 0105-MW4 **Sampler(s):** R. Winfield/J. Kerly

Well Location: between MW-5 and MW-2

Well Diameter: 2 inches

Initial Depth to Water (DTW): 14.42 feet

Depth to Bottom (DTB): 24.22 feet

Water Column Thickness (WCT): 9.80 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 1.60 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 4.79 gallons

Actual Amount Purged/Bailed : 4.79 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 14.41 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	9:42	16.8	5.35	67.3	82.8	RW
1.60	9:44	16.0	4.85	228	615	RW
3.20	9:47	16.1	5.01	525	>1000	RW
4.79	9:52	16.1	5.23	594	>1000	RW
	6/15/10					
Before Sampling	14:00	19.2	5.36	721	56.9	RW

Comments (weather conditions, odor, color, silt, etc.):

Sunny, humid, 80's

Signature: [signature] **Date:** 6/15/10

QA/QC Sign Off: [signature] **Date:** 7-19-10

DATE: 6/15/10

ENGINEERING, INC.

GROUND WATER SAMPLING LOG

Project Name: COBLE'S SANDROCK & LF **Project No./Task No.:** 419.1000.12.02

Well ID: 0105-MW7 **Sampler(s):** R. Winfield/J. Kerly

Well Location: Westside of the landfill near MW5

Well Diameter: 2 inches

Initial Depth to Water (DTW): 9.19 feet

Depth to Bottom (DTB): 16.00 feet

Water Column Thickness (WCT): 6.81 feet [DTB-DTW]

Calculation for One Well Volume (WV):

For 2" Well: WCT X 0.163 = 1.11 gallons

For 4" Well: WCT X 0.653 = _____ gallons

For THREE Well Volumes: WV X 3 = 3.33 gallons

Actual Amount Purged/Bailed : 3.50 gallons

Purged with: disposable bailer

Sampled with: disposable bailer

Depth to Water before Sampling: 9.21 feet

Gallons	Time	Temp(°C)	pH	Cond. (µS)	Turb.(ntu)	Initials
0	10:04	22.1	6.08	1576	162	JJK
1.11	10:06	21.8	6.24	1587	416	JJK
2.22	10:08	21.7	6.36	1508	324	JJK
3.33	10:10	21.7	6.37	1507	312	JJK
	6/15/10					
Before Sampling	14:15	22.7	-	1635	13.38	JJK

Comments (weather conditions, odor, color, silt, etc.):

Sunny, warm, humid, 80's

Odor

Field Blank @ 14:20 6/15/10

Signature: [signature] **Date:** 7-15-10

QA/QC Sign Off: [signature] **Date:** 8-4-10

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June 22, 2010

Mr. Jeremey Kerly
Joyce Engineering-NC
2211 West Meadowview Rd
Suite 101
Greensboro, NC 27407

RE: Project: 419.0900.11.02
Pace Project No.: 9271635

Dear Mr. Kerly:
Enclosed are the analytical results for sample(s) received by the laboratory on June 16, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

Inorganic Wet Chemistry and Metals analyses were performed at our Pace Asheville laboratory and Organic testing was performed at our Pace Huntersville laboratory unless otherwise footnoted. All Microbiological analyses were performed at the laboratory where the samples were received.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin

kevin.godwin@pacelabs.com
Project Manager

Enclosures

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CERTIFICATIONS

Project: 419.0900.11.02
Pace Project No.: 9271635

Charlotte Certification IDs

9800 Kincey Ave. - Ste 100 Huntersville, NC 28078
Louisiana/LELAP Certification #: 04034
New Jersey Certification #: NC012
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
Pennsylvania Certification #: 68-00784
South Carolina Certification #: 99006001
South Carolina Drinking Water Cert. #: 99006003
Tennessee Certification #: 04010
Virginia Certification #: 00213
West Virginia Certification #: 357
Connecticut Certification #: PH-0104
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84

Asheville Certification IDs

2225 Riverside Dr. Asheville, NC 28804
Connecticut Certification #: PH-0106
Florida/NELAP Certification #: E87648
Louisiana/LELAP Certification #: 03095
Massachusetts Certification #: M-NC030
New Jersey Certification #: NC011
North Carolina Bioassay Certification #: 9
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
Pennsylvania Certification #: 68-03578
South Carolina Bioassay Certification #: 9903002
South Carolina Certification #: 9903001
Tennessee Certification #: 2980
Virginia Certification #: 00072
West Virginia Certification #: 356

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SAMPLE SUMMARY

Project: 419.0900.11.02
Pace Project No.: 9271635

Lab ID	Sample ID	Matrix	Date Collected	Date Received
9271635001	**SOIL SAMPLE 1 (SS-1)**	Solid	06/15/10 12:06	06/16/10 16:25
9271635002	**SOIL SAMPLE 2 (SS-2)**	Solid	06/15/10 11:29	06/16/10 16:25
9271635003	**SOIL SAMPLE 3 (SS-3)**	Solid	06/15/10 10:51	06/16/10 16:25
9271635004	**SOIL SAMPLE 4 (SS-4)**	Solid	06/15/10 10:24	06/16/10 16:25

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SAMPLE ANALYTE COUNT

Project: 419.0900.11.02
Pace Project No.: 9271635

Lab ID	Sample ID	Method	Analysts	Analytes Reported
9271635001	**SOIL SAMPLE 1 (SS-1)**	EPA 6010	JMW	3
		ASTM D2974-87	TNM	1
9271635002	**SOIL SAMPLE 2 (SS-2)**	EPA 6010	JMW	3
		ASTM D2974-87	TNM	1
9271635003	**SOIL SAMPLE 3 (SS-3)**	EPA 6010	JMW	2
		ASTM D2974-87	TNM	1
9271635004	**SOIL SAMPLE 4 (SS-4)**	EPA 6010	JMW	2
		ASTM D2974-87	TNM	1

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ANALYTICAL RESULTS

Project: 419.0900.11.02
Pace Project No.: 9271635

Sample: SOIL SAMPLE 1 (SS-1) **Lab ID: 9271635001** Collected: 06/15/10 12:06 Received: 06/16/10 16:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Chromium	**2.5**	mg/kg	0.39	0.024	1	06/18/10 15:25	06/21/10 17:08	7440-47-3	
Iron	**7320**	mg/kg	3.9	0.36	1	06/18/10 15:25	06/21/10 17:08	7439-89-6	
Manganese	**22.1**	mg/kg	0.39	0.024	1	06/18/10 15:25	06/21/10 17:08	7439-96-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**29.7**	%	0.10	0.10	1		06/17/10 13:58		

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ANALYTICAL RESULTS

Project: 419.0900.11.02
Pace Project No.: 9271635

Sample: SOIL SAMPLE 2 (SS-2) **Lab ID: 9271635002** Collected: 06/15/10 11:29 Received: 06/16/10 16:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Chromium	**4.1**	mg/kg	0.39	0.023	1	06/18/10 15:25	06/21/10 17:11	7440-47-3	
Iron	**12700**	mg/kg	38.9	3.6	10	06/18/10 15:25	06/22/10 14:39	7439-89-6	
Manganese	**149**	mg/kg	0.39	0.023	1	06/18/10 15:25	06/21/10 17:11	7439-96-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**24.4**	%	0.10	0.10	1		06/17/10 13:58		

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ANALYTICAL RESULTS

Project: 419.0900.11.02
Pace Project No.: 9271635

Sample: SOIL SAMPLE 3 (SS-3) **Lab ID: 9271635003** Collected: 06/15/10 10:51 Received: 06/16/10 16:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Iron	**28300**	mg/kg	44.4	4.1	10	06/18/10 15:25	06/22/10 14:42	7439-89-6	
Manganese	**226**	mg/kg	0.44	0.027	1	06/18/10 15:25	06/21/10 17:14	7439-96-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**10.5**	%	0.10	0.10	1		06/17/10 13:58		

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ANALYTICAL RESULTS

Project: 419.0900.11.02
Pace Project No.: 9271635

Sample: SOIL SAMPLE 4 (SS-4) **Lab ID: 9271635004** Collected: 06/15/10 10:24 Received: 06/16/10 16:25 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Iron	**12600**	mg/kg	37.5	3.4	10	06/18/10 15:25	06/22/10 14:55	7439-89-6	
Manganese	**33.3**	mg/kg	0.37	0.022	1	06/18/10 15:25	06/21/10 17:18	7439-96-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**22.4**	%	0.10	0.10	1		06/17/10 13:59		

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QUALITY CONTROL DATA

Project: 419.0900.11.02
Pace Project No.: 9271635

QC Batch: MPRP/6536 Analysis Method: EPA 6010
QC Batch Method: EPA 3050 Analysis Description: 6010 MET
Associated Lab Samples: 9271635001, 9271635002, 9271635003, 9271635004

METHOD BLANK: 458222 Matrix: Solid
Associated Lab Samples: 9271635001, 9271635002, 9271635003, 9271635004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chromium	mg/kg	ND	0.50	06/21/10 16:14	
Iron	mg/kg	6.6	5.0	06/21/10 16:14	P8
Manganese	mg/kg	0.054J	0.50	06/21/10 16:14	

LABORATORY CONTROL SAMPLE: 458223

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	50	56.1	112	80-120	
Iron	mg/kg	500	522	104	80-120	
Manganese	mg/kg	50	54.2	108	80-120	

MATRIX SPIKE SAMPLE: 458224

Parameter	Units	9271716001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium	mg/kg	144 ug/g	29.1	180	123	75-125	
Iron	mg/kg	234 ug/g	291	573	117	75-125	
Manganese	mg/kg	8.57 ug/g	29.1	40.6	110	75-125	

SAMPLE DUPLICATE: 458225

Parameter	Units	9271718001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium	mg/kg	ND	ND		20	
Iron	mg/kg	4.26 ug/g	2.5J		20	
Manganese	mg/kg	ND	0.029J		20	

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QUALITY CONTROL DATA

Project: 419.0900.11.02
Pace Project No.: 9271635

QC Batch: PMST/3241 | Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 | Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 9271635001, 9271635002, 9271635003, 9271635004

SAMPLE DUPLICATE: 457222

Parameter	Units	9271654001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	22.5	20.6	9	25	

SAMPLE DUPLICATE: 457223

Parameter	Units	9271635004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	22.4	21.7	3	25	

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QUALIFIERS

Project: 419.0900.11.02
Pace Project No.: 9271635

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

ANALYTE QUALIFIERS

P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 419.0900.11.02
Pace Project No.: 9271635

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
9271635001	**SOIL SAMPLE 1 (SS-1)**	EPA 3050	MPRP/6536	EPA 6010	ICP/6031
9271635002	**SOIL SAMPLE 2 (SS-2)**	EPA 3050	MPRP/6536	EPA 6010	ICP/6031
9271635003	**SOIL SAMPLE 3 (SS-3)**	EPA 3050	MPRP/6536	EPA 6010	ICP/6031
9271635004	**SOIL SAMPLE 4 (SS-4)**	EPA 3050	MPRP/6536	EPA 6010	ICP/6031
9271635001	**SOIL SAMPLE 1 (SS-1)**	ASTM D2974-87	PMST/3241		
9271635002	**SOIL SAMPLE 2 (SS-2)**	ASTM D2974-87	PMST/3241		
9271635003	**SOIL SAMPLE 3 (SS-3)**	ASTM D2974-87	PMST/3241		
9271635004	**SOIL SAMPLE 4 (SS-4)**	ASTM D2974-87	PMST/3241		

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page : 1 Of 1

Section A
Required Client Information:

Company:	Joyce Engineering, Inc.
Address:	2211 W. Meadowview Rd. Suite 101
	Greensboro, NC 27407
Email To:	jkerly@joyceengineering.com
Phone:	Fax:
Requested Due Date/TAT:	10 Day (Default)

Section B
Required Project Information:

Report To:	Jeremey Kerly
Copy To:	
Purchase Order No.	
Client Project ID:	419.0900.11.02
Container Order Number:	

Section C
Invoice Information:

Attention:	Lecia Jones
Company Name:	Joyce Engineering
Address:	1604 Ownby Lane, Richmond, VA 23220
Pace Quote Reference:	
Pace Project Manager:	Godwin, Kevin
Pace Profile #:	2186-13

Regulatory Agency:

State / Location: North Carolina

Requested Analysis Filtered (Y/N)

ITEM#	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Chromium	Iron	Manganese	Residual Chlorine (Y/N)	9271635
1	Soil Sample 1 (SS-1)	WT	G			6-15-10	1206		1	X									X	X	X		9271635001
2	Soil Sample 2 (SS-2)	WT	G			6-15-10	1129		1	X									X	X	X		002
3	Soil Sample 3 (SS-3)	WT	G			6-15-10	1051		1	X										X	X		003
4	Soil Sample 4 (SS-4)	WT	G			6-15-10	1024		1	X										X	X		004
5		WT																					
6		WT																					
7		WT																					
8		WT																					
9		WT																					
10		WT																					
11		WT																					
12		WT																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	SEI	6-16-10	9:00	Pace	6/17/10	1210
	Pace	6/16/10	1625		6/16/10	16:45

SAMPLE CONDITIONS

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.2	yes	no	yes

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremey Kerly Robert Winfield

SIGNATURE of SAMPLER: DATE Signed: 6-15-10

Appendix 2 Statistical Analyses Worksheets

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Analyte: **Barium**

Sample No.	Sample Date	Location	Concentration		Quantitation Limit	Sorted Concentration	
1	Nov-03	MW-6	ND		500	37.8	357
2	Apr-04	MW-6	ND		500	41.3	120
3	Oct-04	MW-6	ND		500	58.8	113
4	Apr-05	MW-6	ND		500	59.0	101
5	Oct-05	MW-6	ND		500	62.4	95.0
6	28-Apr-06	MW-6	ND		500	74.1	85.5
7	11-Oct-06	MW-6	ND		500	85.5	74.1
8	19-Apr-07	MW-6	58.8	J	100	95.0	62.4
9	11-Oct-07	MW-6	38.2	B	100	101	59.0
10	15-Apr-08	MW-6	37.8	J	100	113	58.8
11	15-Oct-08	MW-6	41.3	J	100	120	41.3
12	22-Apr-09	MW-6	46.4	B	100	357	37.8
13	08-Oct-09	MW-6	39.7	B	100		
14	27-Apr-10	MW-6	42.1	B	100		
15	19-Mar-09	MW-8	357		100		
16	22-Apr-09	MW-8	95.0	J	100		
17	14-May-09	MW-8	101		100		
18	08-Oct-09	MW-8	120		100		
19	19-Mar-09	MW-10S	59.0	J	100		
20	22-Apr-09	MW-10S	56.5	B	100		
21	14-May-09	MW-10S	49.1	B	100		
22	08-Oct-09	MW-10S	85.5	J	100		
23	19-Mar-09	P-19S	62.4	J	100		
24	22-Apr-09	P-19S	63.2	B	100		
25	14-May-09	P-19S	74.1		100		
26	08-Oct-09	P-19S	113		100		

Number of Data: 19
Number of Truncated Data: 7
Percentage of Truncated Data: 37%

Parametric Tolerance Interval: 3653 µg/L

- All concentrations in micrograms per liter (µg/L).
- J = Estimated value below quantitation linit..
- B = Blank qualified data not used in statistical calculations.
- Background data included from MW-8, MW-10S, and P-19S.
- Background well MW-6.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Barium**

Complete the following table where

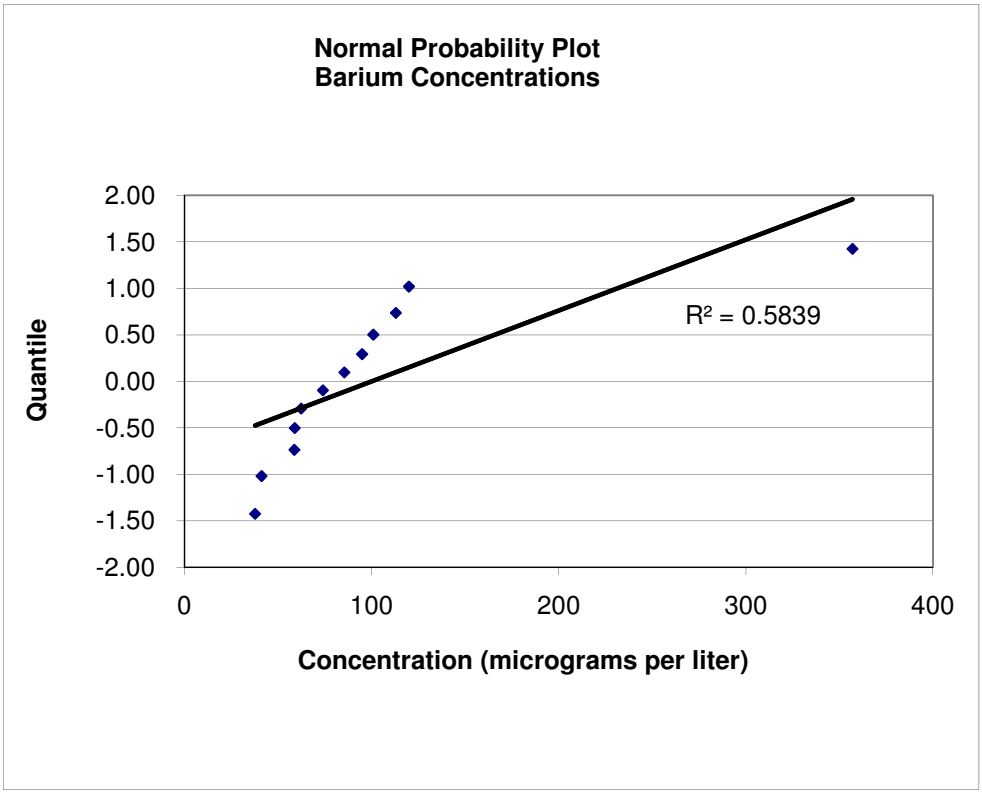
i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
LN[X(i)] = Natural Log Value of sample concentrations arranged from smallest to largest
[i/(n+1)] = Cumulative probability
n = number of samples = 12

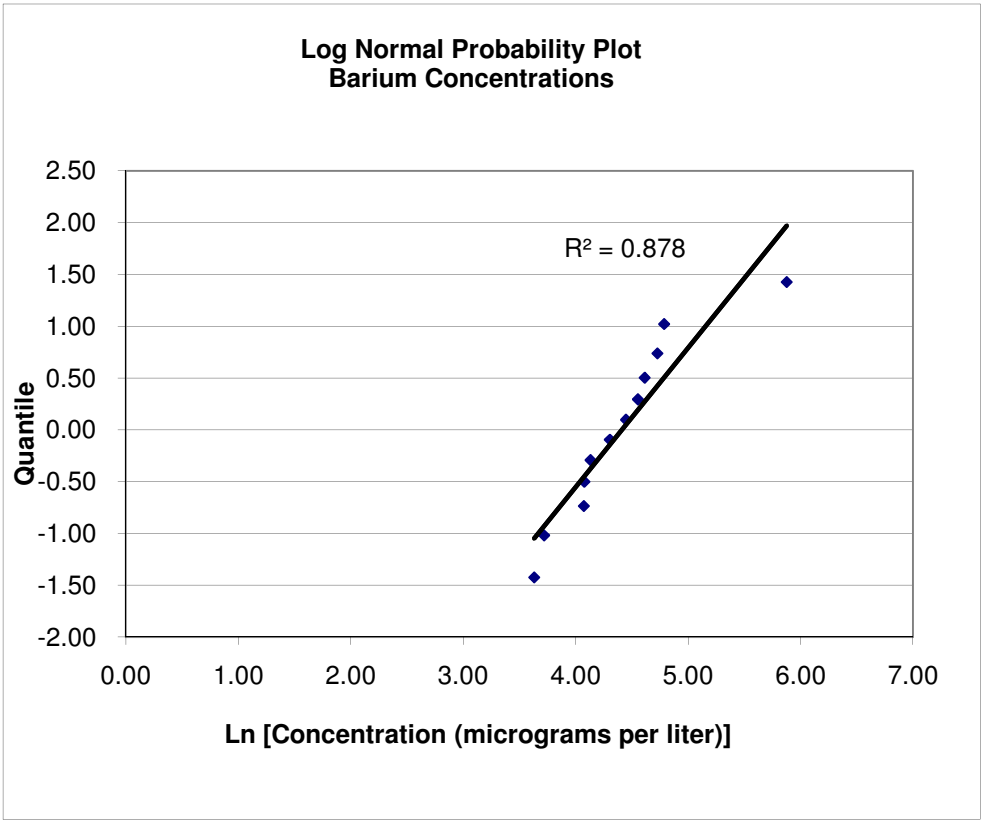
X(i)	LN[X(i)]	i	Rank	[Rank/(n+1)]	Quantiles
37.8	3.63	1	1	0.077	-1.43
41.3	3.72	2	2	0.154	-1.02
58.8	4.07	3	3	0.231	-0.74
59	4.08	4	4	0.308	-0.50
62.4	4.13	5	5	0.385	-0.29
74.1	4.31	6	6	0.462	-0.10
85.5	4.45	7	7	0.538	0.10
95	4.55	8	8	0.615	0.29
101	4.62	9	9	0.692	0.50
113	4.73	10	10	0.769	0.74
120	4.79	11	11	0.846	1.02
357	5.88	12	12	0.923	1.43

Plot analysis indicates that the data more closely follow a normal distribution in the log-transformed format.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Barium**





JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Determination of reported background value as an outlier

Analyte: **Barium**

Background Data

Sample No.	Sample Date	Location	ln(Concentration) (ug/l)		Quantitation Limit (ug/l)
1	11-Nov-03	MW-6	ND		500
2	20-Apr-04	MW-6	ND		500
3	19-Oct-04	MW-6	ND		500
4	19-Apr-05	MW-6	ND		500
5	20-Oct-05	MW-6	ND		500
6	28-Apr-06	MW-6	ND		500
7	11-Oct-06	MW-6	ND		500
8	19-Apr-07	MW-6	4.074	J	100
9	11-Oct-07	MW-6	B flagged	B	100
10	15-Apr-08	MW-6	3.632	J	100
11	15-Oct-08	MW-6	3.721	J	100
12	22-Apr-09	MW-6	B flagged	B	100
13	08-Oct-09	MW-6	B flagged	B	100
14	27-Apr-10	MW-6	B flagged	B	100
15	19-Mar-09	MW-8	5.878		100
16	22-Apr-09	MW-8	4.554	J	100
17	14-May-09	MW-8	4.615		100
18	08-Oct-09	MW-8	4.787		100
19	19-Mar-09	MW-10S	4.078	J	100
20	22-Apr-09	MW-10S	B flagged	B	100
21	14-May-09	MW-10S	B flagged	B	100
22	08-Oct-09	MW-10S	4.449	J	100
23	19-Mar-09	P-19S	4.134	J	100
24	22-Apr-09	P-19S	B flagged	B	100
25	14-May-09	P-19S	4.305		100
26	08-Oct-09	P-19S	4.727		100
		mean =	4.413		
		STD =	0.592		

Note: All concentrations are micrograms per liter

Using the data listed above, form the statisitc Tn:

Tn = (Xn - mean) / STD

where: Xn = largest observed sample value
mean = mean of the background values
STD = standard deviation of the background values

For Xn = 5.878
mean = 4.413
STD = 0.592

Tn = 2.475

From Table 8 included in the Staistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance, the critical value for the given sample group is

Number of samples = 19
Tc = 2.532

Since Tc>Tn, the sample result is not considered to be an outlier

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Shapiro Wilk Test Statistic (W) for normality of total **Barium**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	37.80	357.00	319.2	0.5475	174.76
2	41.30	120.00	78.7	0.3325	26.17
3	58.80	113.00	54.2	0.2347	12.72
4	59.00	101.00	42	0.1586	6.66
5	62.40	95.00	32.6	0.0922	3.01
6	74.10	85.50	11.4	0.0303	0.35
7	85.50	74.10	-11.4		
8	95.00	62.40	-32.6		
9	101.00	59.00	-42		
10	113.00	58.80	-54.2		
11	120.00	41.30	-78.7		
12	357.00	37.80	-319.2		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 223.66
SD = standard deviation of the data group = 85.08
n = number of samples = 12

W = 0.628

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.859
and the calculated W = 0.628

Therefore the data is Non-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Shapiro Wilk Test Statistic (W) for log normality of total **Barium**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	3.63	5.88	2.25	0.5475	1.23
2	3.72	4.79	1.07	0.3325	0.35
3	4.07	4.73	0.65	0.2347	0.15
4	4.08	4.62	0.54	0.1586	0.09
5	4.13	4.55	0.42	0.0922	0.04
6	4.31	4.45	0.14	0.0303	0.00
7	4.45	4.31	-0.14		
8	4.55	4.13	-0.42		
9	4.62	4.08	-0.54		
10	4.73	4.07	-0.65		
11	4.79	3.72	-1.07		
12	5.88	3.63	-2.25		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 1.87
SD = standard deviation of the data group = 0.59
n = number of samples = 12

W = 0.904

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.859
and the calculated W = 0.904

Therefore the data set is Log-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Aitchison's Adjustment for **Barium**

Background Values (positive detects only)

Sample No.	Sample Date	Location	Concentration (ug/l)		ln(conc)
1	Nov-03	MW-6	ND		ND
2	Apr-04	MW-6	ND		ND
3	Oct-04	MW-6	ND		ND
4	Apr-05	MW-6	ND		ND
5	Oct-05	MW-6	ND		ND
6	28-Apr-06	MW-6	ND		ND
7	11-Oct-06	MW-6	ND		ND
8	19-Apr-07	MW-6	58.8	J	4.074
9	11-Oct-07	MW-6	38.2	B	B Flagged
10	15-Apr-08	MW-6	37.8	J	3.632
11	15-Oct-08	MW-6	41.3	J	3.721
12	22-Apr-09	MW-6	46.4	B	B Flagged
13	08-Oct-09	MW-6	39.7	B	B Flagged
14	27-Apr-10	MW-6	42.1	B	B Flagged
15	19-Mar-09	MW-8	357.0		5.878
16	22-Apr-09	MW-8	95.0	J	4.554
17	14-May-09	MW-8	101.0		4.615
18	08-Oct-09	MW-8	120.0		4.787
19	19-Mar-09	MW-10S	59.0	J	4.078
20	22-Apr-09	MW-10S	56.5	B	B Flagged
21	14-May-09	MW-10S	49.1	B	B Flagged
22	08-Oct-09	MW-10S	85.5	J	4.449
23	19-Mar-09	P-19S	62.4	J	4.134
24	22-Apr-09	P-19S	63.2	B	B Flagged
25	14-May-09	P-19S	74.1		4.305
26	08-Oct-09	P-19S	113.0		4.727

Mean of detected values = 4.413
Standard Deviation of detected values = 0.592

The adjusted mean can be found using

$$M(a) = (1-d/n) \times M$$

where:	d =	number non- detected values	=	7
	n =	total number samples	=	19
	M =	mean detected values	=	4.413
		M(a)	**=**	**2.787**

The adjusted standard deviation squared may be found using

$$STD(a) = [(n-(d+1))/(n-1)]\ S + d/n((n-d)/(n-1))MM$$

where:	n =	total number samples	=	19
	d =	number non-detected values	=	7
	S =	std deviation of detected values squared =	=	0.350
	MM =	mean of detected values squared	=	19.47
		STD(a)	=	4.997

and the adjusted standard deviation is then

S(a) = SQRT(STD(a)) **=** **2.235**

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Parametric Tolerance Interval for Aitchison's adjusted data

Analyte: **Barium**

Background Data

Sample No.	Sample Date	Location	Concentration (ug/l)		ln(Concentration) (ug/l)
1	Nov-03	MW-6	ND		ND
2	Apr-04	MW-6	ND		ND
3	Oct-04	MW-6	ND		ND
4	Apr-05	MW-6	ND		ND
5	Oct-05	MW-6	ND		ND
6	28-Apr-06	MW-6	ND		ND
7	11-Oct-06	MW-6	ND		ND
8	19-Apr-07	MW-6	58.8	J	4.074
9	11-Oct-07	MW-6	38.2	B	B Flagged
10	15-Apr-08	MW-6	37.8	J	3.632
11	15-Oct-08	MW-6	41.3	J	3.721
12	22-Apr-09	MW-6	46.4	B	B Flagged
13	08-Oct-09	MW-6	39.7	B	B Flagged
14	27-Apr-10	MW-6	42.1	B	B Flagged
15	19-Mar-09	MW-8	357.0		5.878
16	22-Apr-09	MW-8	95.0	J	4.554
17	14-May-09	MW-8	101.0		4.615
18	08-Oct-09	MW-8	120.0		4.787
19	19-Mar-09	MW-10S	59.0	J	4.078
20	22-Apr-09	MW-10S	56.5	B	B Flagged
21	14-May-09	MW-10S	49.1	B	B Flagged
22	08-Oct-09	MW-10S	85.5	J	4.449
23	19-Mar-09	P-19S	62.4	J	4.134
24	22-Apr-09	P-19S	63.2	B	B Flagged
25	14-May-09	P-19S	74.1		4.305
26	08-Oct-09	P-19S	113.0		4.727

Note: All sample concentrations are micrograms per liter

The background mean and standard deviation were modified using Aitchison's Adjustment.
The adjusted mean and standard deviation are as follows:

The ln(adjusted mean) and ln(standard deviation) are

ln(adjusted mean) = 2.787
ln(adjusted standard deviation) = 2.235

Using the background data, the upper Tolerance Limit can be determined using

Upper Tolerance Limit = (Mean Concentration) + K x (Standard Deviation Samples)

where: K = factor for constructing one sided normal tolerance limit taken from table 4-2, page 87, Statistical Methods for Groundwater Monitoring, Gibbons, 1994
n = number of background samples

For: K = 2.423
n = 19

UTL = 3653.1 µg/L

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Analyte: **Chromium**

Sample No.	Sample Date	Location	Concentration		Quantitation Limit	Sorted Concentration	
1	Nov-03	MW-6	ND		10	0.41	25.1
2	Apr-04	MW-6	ND		10	0.41	25.0
3	Oct-04	MW-6	ND		10	0.45	14.3
4	Apr-05	MW-6	ND		10	0.53	10.2
5	Oct-05	MW-6	ND		10	1.6	8.6
6	28-Apr-06	MW-6	ND		10	1.7	7.6
7	11-Oct-06	MW-6	ND		10.0	6.3	6.5
8	19-Apr-07	MW-6	ND		10	6.5	6.3
9	11-Oct-07	MW-6	1.7	J	10	7.6	1.7
10	15-Apr-08	MW-6	1.5	B	10.0	8.6	1.6
11	15-Oct-08	MW-6	1.6	J	10.0	10.2	0.53
12	22-Apr-09	MW-6	0.53	J	10.0	14.3	0.45
13	08-Oct-09	MW-6	0.41	J	10.0	25.0	0.41
14	27-Apr-10	MW-6	0.41	J	10.0	25.1	0.41
15	19-Mar-09	MW-8	25.0		10.0		
16	22-Apr-09	MW-8	6.5	J	10.0		
17	14-May-09	MW-8	6.3	J	10.0		
18	08-Oct-09	MW-8	8.6	J	10.0		
19	19-Mar-09	MW-10S	14.3		10.0		
20	22-Apr-09	MW-10S	10.2		10.0		
21	14-May-09	MW-10S	7.6	J	10.0		
22	08-Oct-09	MW-10S	25.1		10.0		
23	19-Mar-09	P-19S	0.57	B	10.0		
24	22-Apr-09	P-19S	ND		10.0		
25	14-May-09	P-19S	ND		10.0		
26	08-Oct-09	P-19S	0.45	J	10.0		

Number of Data: 24
Number of Truncated Data: 10
Percentage of Truncated Data: 42%

Parametric Tolerance Interval: 42.5 µg/L

- All concentrations in micrograms per liter (µg/L).
- J = Estimated value below quantitation linit..
- B = Blank qualified data not used in statistical calculations.
- Background data included from MW-8, MW-10S, and P-19S.
- Background well MW-6.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Chromium**

Complete the following table where

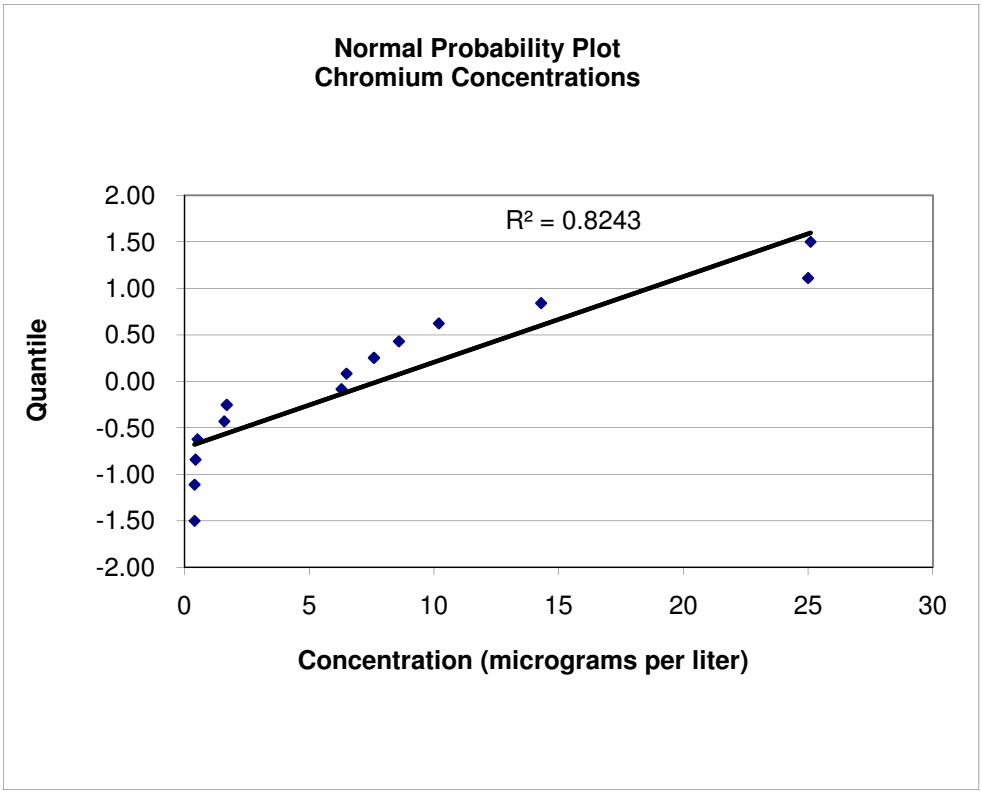
i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
LN[X(i)] = Natural Log Value of sample concentrations arranged from smallest to largest
[i/(n+1)] = Cumulative probability
n = number of samples = 14

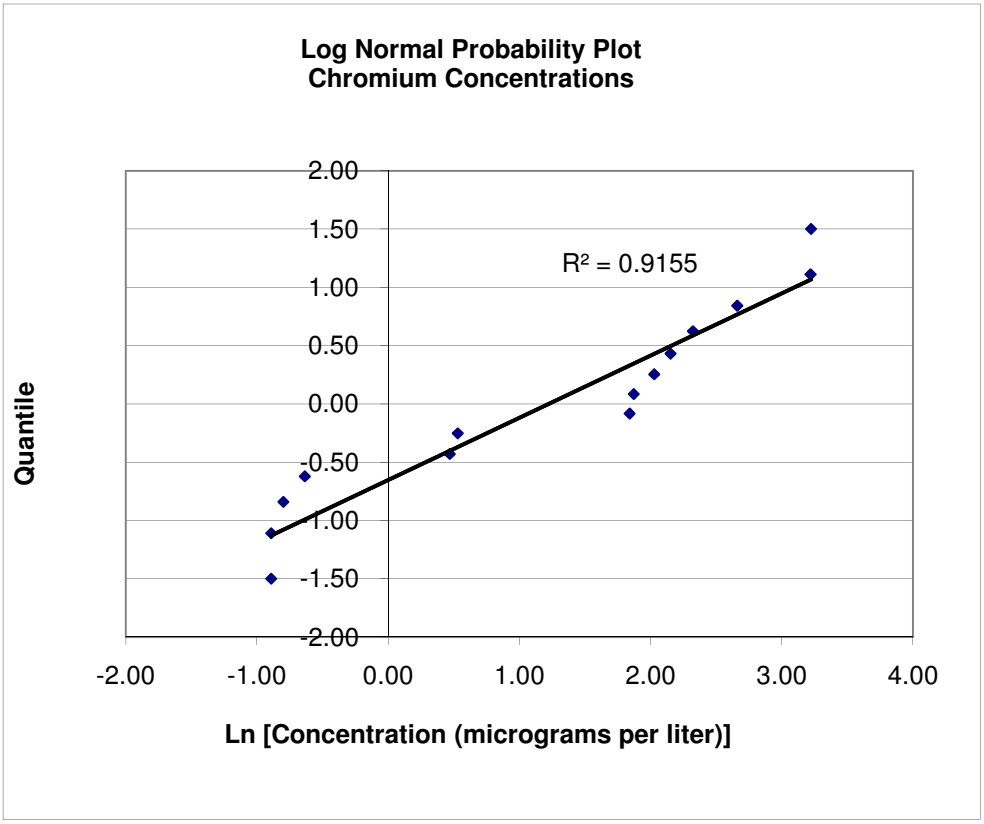
X(i)	LN[X(i)]	i	Rank	[Rank/(n+1)]	Quantiles
0.41	-0.89	1	1	0.067	-1.50
0.41	-0.89	2	2	0.133	-1.11
0.45	-0.80	3	3	0.200	-0.84
0.53	-0.63	4	4	0.267	-0.62
1.6	0.47	5	5	0.333	-0.43
1.7	0.53	6	6	0.400	-0.25
6.3	1.84	7	7	0.467	-0.08
6.5	1.87	8	8	0.533	0.08
7.6	2.03	9	9	0.600	0.25
8.6	2.15	10	10	0.667	0.43
10.2	2.32	11	11	0.733	0.62
14.3	2.66	12	12	0.800	0.84
25	3.22	13	13	0.867	1.11
25.1	3.22	14	14	0.933	1.50

Plot analysis indicates that the data more closely follow a normal distribution in the log-transformed format.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Chromium**





JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Determination of reported background value as an outlier

Analyte: **Chromium**

Background Data

Sample No.	Sample Date	Location	ln(Concentration) (ug/l)		Quantitation Limit (ug/l)
1	Nov-03	MW-6	ND		10
2	Apr-04	MW-6	ND		10
3	Oct-04	MW-6	ND		10
4	Apr-05	MW-6	ND		10
5	Oct-05	MW-6	ND		10
6	28-Apr-06	MW-6	ND		10
7	11-Oct-06	MW-6	ND		10.0
8	19-Apr-07	MW-6	ND		10
9	11-Oct-07	MW-6	0.531	J	10
10	15-Apr-08	MW-6	B flagged	B	10.0
11	15-Oct-08	MW-6	0.470	J	10.0
12	22-Apr-09	MW-6	-0.635	J	10.0
13	08-Oct-09	MW-6	-0.892	J	10.0
14	27-Apr-10	MW-6	-0.892	J	10.0
15	19-Mar-09	MW-8	3.219		10.0
16	22-Apr-09	MW-8	1.872	J	10.0
17	14-May-09	MW-8	1.841	J	10.0
18	08-Oct-09	MW-8	2.152	J	10.0
19	19-Mar-09	MW-10S	2.660		10.0
20	22-Apr-09	MW-10S	2.322		10.0
21	14-May-09	MW-10S	2.028	J	10.0
22	08-Oct-09	MW-10S	3.223		10.0
23	19-Mar-09	P-19S	B flagged	B	10.0
24	22-Apr-09	P-19S	ND		10.0
25	14-May-09	P-19S	ND		10.0
26	08-Oct-09	P-19S	-0.799	J	10.0
		mean =	1.221		
		STD =	1.547		

Note: All concentrations are micrograms per liter

Using the data listed above, form the statisitc Tn:

Tn = (Xn - mean) / STD

where: Xn = largest observed sample value
mean = mean of the background values
STD = standard deviation of the background values

For Xn = 3.223
mean = 1.221
STD = 1.547

Tn = 1.294

From Table 8 included in the Staistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance, the critical value for the given sample group is

Number of samples = 24
Tc = 2.644

Since Tc>Tn, the sample result is not considered to be an outlier

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Shapiro Wilk Test Statistic (W) for normality of total **Chromium**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	0.41	25.10	24.69	0.5251	12.96
2	0.41	25.00	24.59	0.3318	8.16
3	0.45	14.30	13.85	0.2460	3.41
4	0.53	10.20	9.67	0.1802	1.74
5	1.60	8.60	7	0.1240	0.87
6	1.70	7.60	5.9	0.0727	0.43
7	6.30	6.50	0.2	0.0240	0.00
8	6.50	6.30	-0.2		
9	7.60	1.70	-5.9		
10	8.60	1.60	-7		
11	10.20	0.53	-9.67		
12	14.30	0.45	-13.85		
13	25.00	0.41	-24.59		
14	25.10	0.41	-24.69		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 27.58
SD = standard deviation of the data group = 8.50
n = number of samples = 14

W = 0.809

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.874
and the calculated W = 0.809

Therefore the data is Non-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Shapiro Wilk Test Statistic (W) for log normality of total **Chromium**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	-0.89	3.22	4.11	0.5251	2.16
2	-0.89	3.22	4.11	0.3318	1.36
3	-0.80	2.66	3.46	0.246	0.85
4	-0.63	2.32	2.96	0.1802	0.53
5	0.47	2.15	1.68	0.124	0.21
6	0.53	2.03	1.50	0.0727	0.11
7	1.84	1.87	0.03	0.024	0.00
8	1.87	1.84	-0.03		
9	2.03	0.53	-1.50		
10	2.15	0.47	-1.68		
11	2.32	-0.63	-2.96		
12	2.66	-0.80	-3.46		
13	3.22	-0.89	-4.11		
14	3.22	-0.89	-4.11		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 5.23
SD = standard deviation of the data group = 1.55
n = number of samples = 14

W = 0.878

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.874
and the calculated W = 0.878

Therefore the data set is Log-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Aitchison's Adjustment for **Chromium**

Background Values (positive detects only)

Sample No.	Sample Date	Location	Concentration (ug/l)		ln(conc)
1	Nov-03	MW-6	ND		ND
2	Apr-04	MW-6	ND		ND
3	Oct-04	MW-6	ND		ND
4	Apr-05	MW-6	ND		ND
5	Oct-05	MW-6	ND		ND
6	28-Apr-06	MW-6	ND		ND
7	11-Oct-06	MW-6	ND		ND
8	19-Apr-07	MW-6	ND		ND
9	11-Oct-07	MW-6	1.7	J	0.531
10	15-Apr-08	MW-6	1.5	B	B Flagged
11	15-Oct-08	MW-6	1.6	J	0.470
12	22-Apr-09	MW-6	0.5	J	-0.635
13	08-Oct-09	MW-6	0.4	J	-0.892
14	27-Apr-10	MW-6	0.4	J	-0.892
15	19-Mar-09	MW-8	25.0		3.219
16	22-Apr-09	MW-8	6.5	J	1.872
17	14-May-09	MW-8	6.3	J	1.841
18	08-Oct-09	MW-8	8.6	J	2.152
19	19-Mar-09	MW-10S	14.3		2.660
20	22-Apr-09	MW-10S	10.2		2.322
21	14-May-09	MW-10S	7.6	J	2.028
22	08-Oct-09	MW-10S	25.1		3.223
23	19-Mar-09	P-19S	0.57	B	B Flagged
24	22-Apr-09	P-19S	ND		ND
25	14-May-09	P-19S	ND		ND
26	08-Oct-09	P-19S	0.45	J	-0.799

Mean of detected values = 1.221
Standard Deviation of detected values = 1.547

The adjusted mean can be found using

$$M(a) = (1-d/n) \times M$$

where:	d =	number non- detected values	=	10
	n =	total number samples	=	24
	M =	mean detected values	=	1.221
		M(a)	**=**	**0.713**

The adjusted standard deviation squared may be found using

$$STD(a) = [(n-(d+1))/(n-1)]\ S + d/n((n-d)/(n-1))MM$$

where:	n =	total number samples	=	24
	d =	number non-detected values	=	10
	S =	std deviation of detected values squared =	=	2.392
	MM =	mean of detected values squared	=	1.49
		STD(a)	=	1.731

and the adjusted standard deviation is then

S(a) = SQRT(STD(a)) = 1.315

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Parametric Tolerance Interval for Aitchison's adjusted data

Analyte: **Chromium**

Background Data

Sample No.	Sample Date	Location	Concentration (ug/l)		ln(Concentration) (ug/l)
1	Nov-03	MW-6	ND		ND
2	Apr-04	MW-6	ND		ND
3	Oct-04	MW-6	ND		ND
4	Apr-05	MW-6	ND		ND
5	Oct-05	MW-6	ND		ND
6	Apr-06	MW-6	ND		ND
7	Oct-06	MW-6	ND		ND
8	Apr-07	MW-6	ND		ND
9	Oct-07	MW-6	1.7	J	0.531
10	Apr-08	MW-6	1.5	B	B Flagged
11	Oct-08	MW-6	1.6	J	0.470
12	Apr-09	MW-6	0.5	J	-0.635
13	Oct-09	MW-6	0.4	J	-0.892
14	Apr-10	MW-6	0.4	J	-0.892
15	Mar-09	MW-8	25.0		3.219
16	Apr-09	MW-8	6.5	J	1.872
17	May-09	MW-8	6.3	J	1.841
18	Oct-09	MW-8	8.6	J	2.152
19	Mar-09	MW-10S	14.3		2.660
20	Apr-09	MW-10S	10.2		2.322
21	May-09	MW-10S	7.6	J	2.028
22	Oct-09	MW-10S	25.1		3.223
23	Mar-09	P-19S	0.6	B	B Flagged
24	Apr-09	P-19S	ND		ND
25	May-09	P-19S	ND		ND
26	Oct-09	P-19S	0.5	J	-0.799

Note: All sample concentrations are micrograms per liter

The background mean and standard deviation were modified using Aitchison's Adjustment.
The adjusted mean and standard deviation are as follows:

The ln(adjusted mean) and ln(standard deviation) are

ln(adjusted mean) = 0.713
ln(adjusted standard deviation) = 1.315

Using the background data, the upper Tolerance Limit can be determined using

Upper Tolerance Limit = (Mean Concentration) + K x (Standard Deviation Samples)

where: K = factor for constructing one sided normal tolerance limit taken from table 4-2, page 87, Statistical Methods for Groundwater Monitoring, Gibbons, 1994
n = number of background samples

For: K = 2.309
n = 24

UTL = 42.5 µg/L

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Analyte: **Cobalt**

Sample No.	Sample Date	Location	Concentration		Quantitation Limit	Sorted Concentration	
1	27-Apr-10	MW-6	ND		10.0	5.9	32.8
2	19-Mar-09	MW-8	32.8		10.0	6.1	6.8
3	22-Apr-09	MW-8	9.7	B	10.0	6.8	6.1
4	14-May-09	MW-8	11.1	B	10.0	32.8	5.9
5	08-Oct-09	MW-8	6.1	J	10.0		
6	19-Mar-09	MW-10S	4.5	B	10.0		
7	22-Apr-09	MW-10S	1.8	B	10.0		
8	14-May-09	MW-10S	4.8	B	10.0		
9	08-Oct-09	MW-10S	6.8	J	10.0		
10	19-Mar-09	P-19S	9.9	B	10.0		
11	22-Apr-09	P-19S	10.4	B	10.0		
12	14-May-09	P-19S	10.3	B	10.0		
13	08-Oct-09	P-19S	5.9	J	10.0		

Number of Data: 5
Number of Truncated Data: 1
Percentage of Truncated Data: 20%

Non-Parametric Prediction Interval: 32.8 µg/L

- All concentrations in micrograms per liter (µg/L).
- J = Estimated value below quantitation linit..
- B = Blank qualified data not used in statistical calculations.
- Background data included from MW-8, MW-10S, and P-19S.
- Background well MW-6.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Cobalt**

Complete the following table where

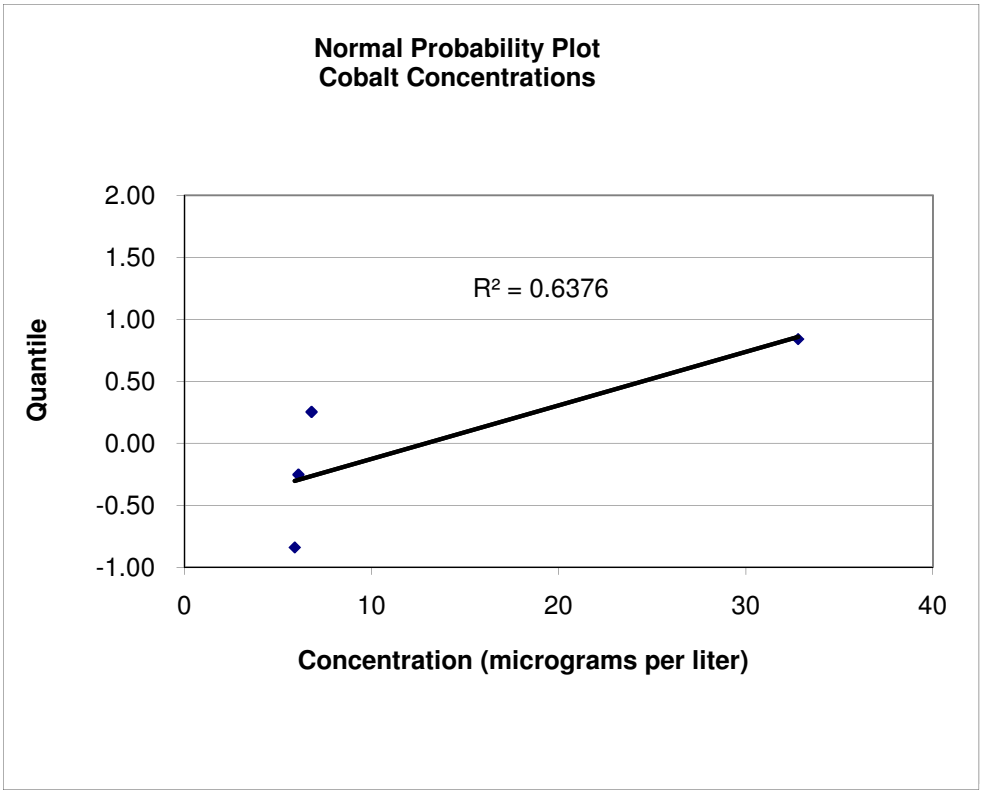
i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
LN[X(i)] = Natural Log Value of sample concentrations arranged from smallest to largest
[i/(n+1)] = Cumulative probability
n = number of samples = 4

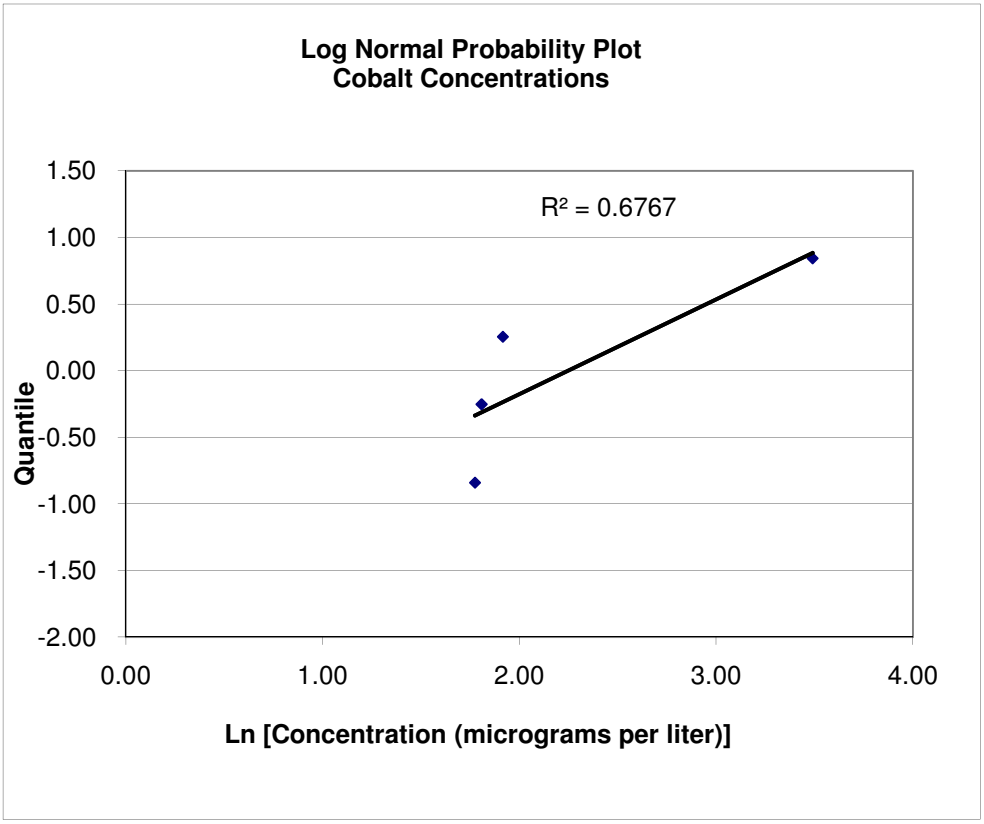
X(i)	LN[X(i)]	i	Rank	[Rank/(n+1)]	Quantiles
5.9	1.77	1	1	0.200	-0.84
6.1	1.81	2	2	0.400	-0.25
6.8	1.92	3	3	0.600	0.25
32.8	3.49	4	4	0.800	0.84

Plot analysis indicates that the data more closely follow a normal distribution in the log-transformed format.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Cobalt**





JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Determination of reported background value as an outlier

Analyte: **Cobalt**

Background Data

Sample No.	Sample Date	Location	ln(Concentration) (ug/l)		Quantitation Limit (ug/l)
1	27-Apr-10	MW-6	ND		10.0
2	19-Mar-09	MW-8	3.490		10.0
3	22-Apr-09	MW-8	B Flagged	B	10.0
4	14-May-09	MW-8	B Flagged	B	10.0
5	08-Oct-09	MW-8	1.808	J	10.0
6	19-Mar-09	MW-10S	B Flagged	B	10.0
7	22-Apr-09	MW-10S	B Flagged	B	10.0
8	14-May-09	MW-10S	B Flagged	B	10.0
9	08-Oct-09	MW-10S	1.917	J	10.0
10	19-Mar-09	P-19S	B Flagged	B	10.0
11	22-Apr-09	P-19S	B Flagged	B	10.0
12	14-May-09	P-19S	B Flagged	B	10.0
13	08-Oct-09	P-19S	1.775	J	10.0
		mean =	2.248		
		STD =	0.831		

Note: All concentrations are micrograms per liter

Using the data listed above, form the statisitc Tn:

Tn = (Xn - mean) / STD

where: Xn = largest observed sample value
mean = mean of the background values
STD = standard deviation of the background values

For Xn = 3.490
mean = 2.248
STD = 0.831

Tn = 1.496

From Table 8 included in the Staistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance, the critical value for the given sample group is

Number of samples = 5
Tc = 1.672

Since Tc>Tn, the sample result is not considered to be an outlier

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Shapiro Wilk Test Statistic (W) for normality of total **Cobalt**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	5.90	32.80	26.9	0.6872	18.49
2	6.10	6.80	0.7	0.1677	0.12
3	6.80	6.10	-0.7		
4	32.80	5.90	-26.9		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 18.60
SD = standard deviation of the data group = 13.27
n = number of samples = 4

W = 0.655

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.748
and the calculated W = 0.655

Therefore the data is Non-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Shapiro Wilk Test Statistic (W) for log normality of total **Cobalt**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	1.77	3.49	1.72	0.6872	1.18
2	1.81	1.92	0.11	0.1677	0.02
3	1.92	1.81	-0.11		
4	3.49	1.77	-1.72		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 1.20
SD = standard deviation of the data group = 0.83
n = number of samples = 4

W = 0.692

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.748
and the calculated W = 0.692

Therefore the data is Non-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Analyte: **Iron**

Sample No.	Sample Date	Location	Concentration		Quantitation Limit	Sorted Concentration	
1	27-Apr-10	MW-6	242	J	300	242	54,500
2	19-Mar-09	MW-8	54,500		300	2,020	19,400
3	22-Apr-09	MW-8	14,600		300	2,680	15,600
4	14-May-09	MW-8	15,600		300	3,150	14,600
5	08-Oct-09	MW-8	19,400		300	3,470	9,670
6	19-Mar-09	MW-10S	4,810		300	4,130	8,060
7	22-Apr-09	MW-10S	3,470		300	4,810	4,810
8	14-May-09	MW-10S	2,680		300	8,060	4,130
9	08-Oct-09	MW-10S	9,670		300	9,670	3,470
10	19-Mar-09	P-19S	3,150		300	14,600	3,150
11	22-Apr-09	P-19S	4,130		300	15,600	2,680
12	14-May-09	P-19S	2,020		300	19,400	2,020
13	08-Oct-09	P-19S	8,060		300	54,500	242

Number of Data: 13
Number of Truncated Data: 0
Percentage of Truncated Data: 0%

Parametric Tolarance Interval: 195,561 µg/L

- All concentrations in micrograms per liter (µg/L).
- J = Estimated value below quantitation linit..
- Background data included from MW-8, MW-10S, and P-19S.
- Background well MW-6.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Iron**

Complete the following table where

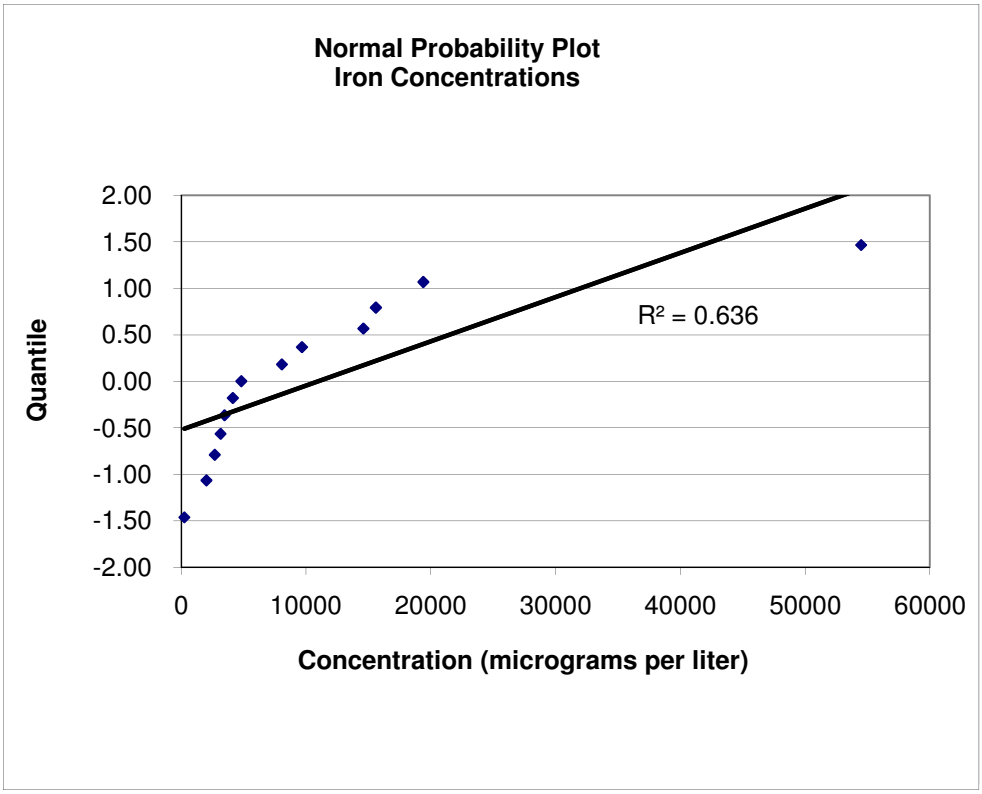
i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
LN[X(i)] = Natural Log Value of sample concentrations arranged from smallest to largest
[i/(n+1)] = Cumulative probability
n = number of samples = 13

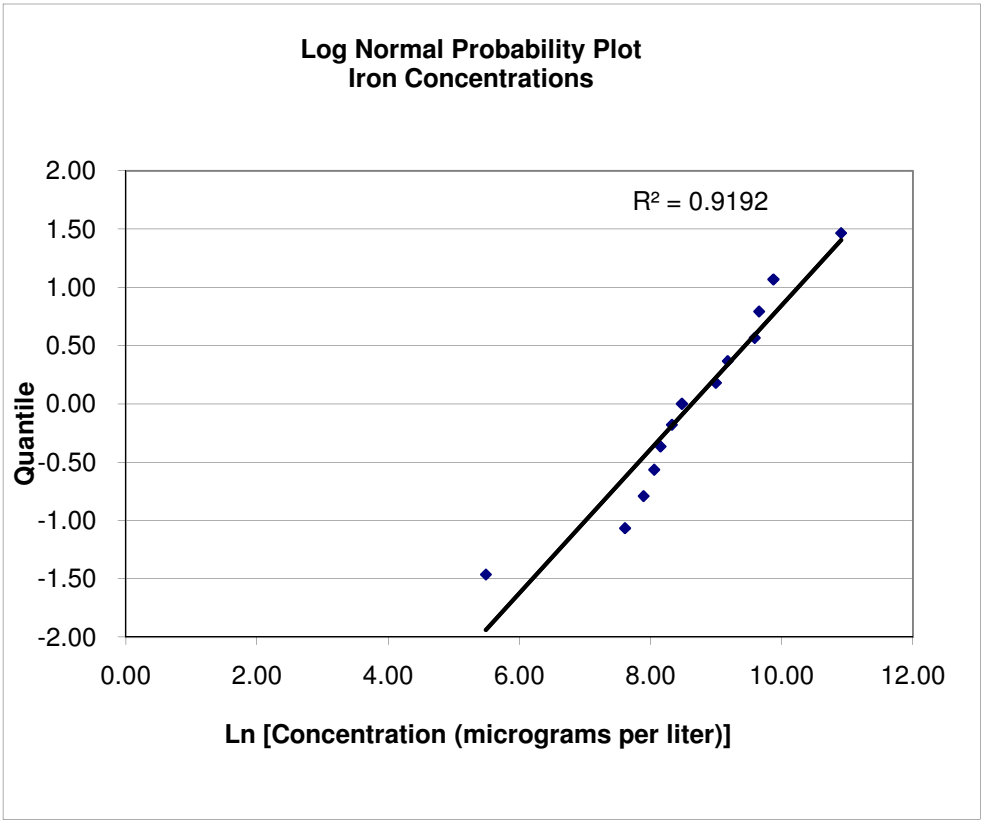
X(i)	LN[X(i)]	i	Rank	[Rank/(n+1)]	Quantiles
242	5.49	1	1	0.071	-1.47
2020	7.61	2	2	0.143	-1.07
2680	7.89	3	3	0.214	-0.79
3150	8.06	4	4	0.286	-0.57
3470	8.15	5	5	0.357	-0.37
4130	8.33	6	6	0.429	-0.18
4810	8.48	7	7	0.500	0.00
8060	8.99	8	8	0.571	0.18
9670	9.18	9	9	0.643	0.37
14600	9.59	10	10	0.714	0.57
15600	9.66	11	11	0.786	0.79
19400	9.87	12	12	0.857	1.07
54500	10.91	13	13	0.929	1.47

Plot analysis indicates that the data more closely follow a normal distribution in the log-transformed format.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Iron**





JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Determination of reported background value as an outlier

Analyte: **Iron**

Background Data

Sample No.	Sample Date	Location	ln(Concentration) (ug/l)		Quantitation Limit (ug/l)
1	27-Apr-10	MW-6	5.489	J	300
2	19-Mar-09	MW-8	10.906		300
3	22-Apr-09	MW-8	9.589		300
4	14-May-09	MW-8	9.655		300
5	08-Oct-09	MW-8	9.873		300
6	19-Mar-09	MW-10S	8.478		300
7	22-Apr-09	MW-10S	8.152		300
8	14-May-09	MW-10S	7.894		300
9	08-Oct-09	MW-10S	9.177		300
10	19-Mar-09	P-19S	8.055		300
11	22-Apr-09	P-19S	8.326		300
12	14-May-09	P-19S	7.611		300
13	08-Oct-09	P-19S	8.995		300
		mean =	8.631		
		STD =	1.331		

Note: All concentrations are micrograms per liter

Using the data listed above, form the statisitc Tn:

Tn = (Xn - mean) / STD

where: Xn = largest observed sample value
mean = mean of the background values
STD = standard deviation of the background values

For Xn = 10.906
mean = 8.631
STD = 1.331

Tn = 1.710

From Table 8 included in the Staistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance, the critical value for the given sample group is

Number of samples = 13
Tc = 2.331

Since Tc>Tn, the sample result is not considered to be an outlier

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Shapiro Wilk Test Statistic (W) for normality of total **Iron**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	242	54,500	54,258	0.5359	29,076.86
2	2,020	19,400	17,380	0.3325	5,778.85
3	2,680	15,600	12,920	0.2412	3,116.30
4	3,150	14,600	11,450	0.1707	1,954.52
5	3,470	9,670	6,200	0.1099	681.38
6	4,130	8,060	3,930	0.0539	211.83
7	4,810	4,810	0		
8	8,060	4,130	-3,930		
9	9,670	3,470	-6,200		
10	14,600	3,150	-11,450		
11	15,600	2,680	-12,920		
12	19,400	2,020	-17,380		
13	54,500	242	-54,258		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 40,819.74
SD = standard deviation of the data group = 14,366.46
n = number of samples = 13

W = 0.673

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.866
and the calculated W = 0.673

Therefore the data is Non-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Shapiro Wilk Test Statistic (W) for log normality of total **Iron**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	5.49	10.91	5.42	0.5359	2.90
2	7.61	9.87	2.26	0.3325	0.75
3	7.89	9.66	1.76	0.2412	0.42
4	8.06	9.59	1.53	0.1707	0.26
5	8.15	9.18	1.02	0.1099	0.11
6	8.33	8.99	0.67	0.0539	0.04
7	8.48	8.48	0.00		
8	8.99	8.33	-0.67		
9	9.18	8.15	-1.02		
10	9.59	8.06	-1.53		
11	9.66	7.89	-1.76		
12	9.87	7.61	-2.26		
13	10.91	5.49	-5.42		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 4.49
SD = standard deviation of the data group = 1.33
n = number of samples = 13

W = 0.949

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.866
and the calculated W = 0.949

Therefore the data set is Log-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Parametric Tolerance Interval for log normally distributed data

Analyte: **Iron**

Background Data: Note use of log(concentration)

Background Data

Sample No.	Sample Date	Location	Concentration (ug/l)		Quantitation Limit (ug/l)	Natural Log Concentration
1	27-Apr-10	MW-6	242	J	300	5.489
2	19-Mar-09	MW-8	54,500		300	10.906
3	22-Apr-09	MW-8	14,600		300	9.589
4	14-May-09	MW-8	15,600		300	9.655
5	08-Oct-09	MW-8	19,400		300	9.873
6	19-Mar-09	MW-10S	4,810		300	8.478
7	22-Apr-09	MW-10S	3,470		300	8.152
8	14-May-09	MW-10S	2,680		300	7.894
9	08-Oct-09	MW-10S	9,670		300	9.177
10	19-Mar-09	P-19S	3,150		300	8.055
11	22-Apr-09	P-19S	4,130		300	8.326
12	14-May-09	P-19S	2,020		300	7.611
13	08-Oct-09	P-19S	8,060		300	8.995

Note: All sample concentrations are micrograms per liter

Using the background data, the upper Tolerance Limit can be determined using:

Upper Tolerance Limit = antilog((Mean Concentration)+K x (Standard Deviation Samples))

where: Mean Conc = mean concentration background samples
K = factor for constructing one sided normal tolerance limit taken from table 4-2, page 87, Statistical Methods for Groundwater Monitoring, Gibbons, 1994
STDS = Standard Deviation Samples
n = number of background samples

For:

n =	13
K =	2.67
Mean Conc =	8.631
STDS =	1.331

UTL = 195,561 µg/L

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Analyte: **Manganese**

Sample No.	Sample Date	Location	Concentration		Quantitation Limit	Sorted Concentration	
1	27-Apr-10	MW-6	9	B	50.0	188	1,890
2	19-Mar-09	MW-8	830		50.0	196	1,280
3	22-Apr-09	MW-8	188		50.0	236	1,050
4	14-May-09	MW-8	196		50.0	359	850
5	08-Oct-09	MW-8	236		50.0	553	830
6	19-Mar-09	MW-10S	359		50.0	640	819
7	22-Apr-09	MW-10S	553		50.0	819	640
8	14-May-09	MW-10S	640		50.0	830	553
9	08-Oct-09	MW-10S	1,050		50.0	850	359
10	19-Mar-09	P-19S	1,280		50.0	1,050	236
11	22-Apr-09	P-19S	850		50.0	1,280	196
12	14-May-09	P-19S	819		50.0	1,890	188
13	08-Oct-09	P-19S	1,890		50.0		

Number of Data: 12
Number of Truncated Data: 0
Percentage of Truncated Data: 0%

Parametric Tolerance Interval: 2,117 µg/L

- All concentrations in micrograms per liter (µg/L).
- B = Blank qualified data not used in statistical calculations.
- Background data included from MW-8, MW-10S, and P-19S.
- Background well MW-6.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Manganese**

Complete the following table where

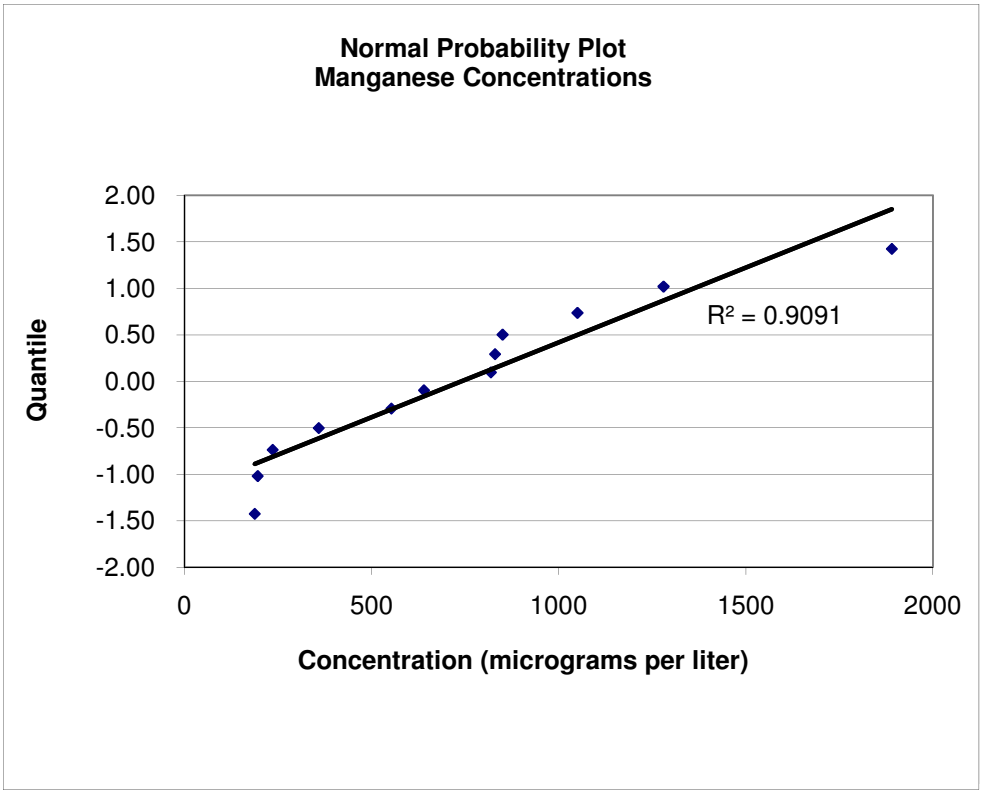
i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
LN[X(i)] = Natural Log Value of sample concentrations arranged from smallest to largest
[i/(n+1)] = Cumulative probability
n = number of samples = 12

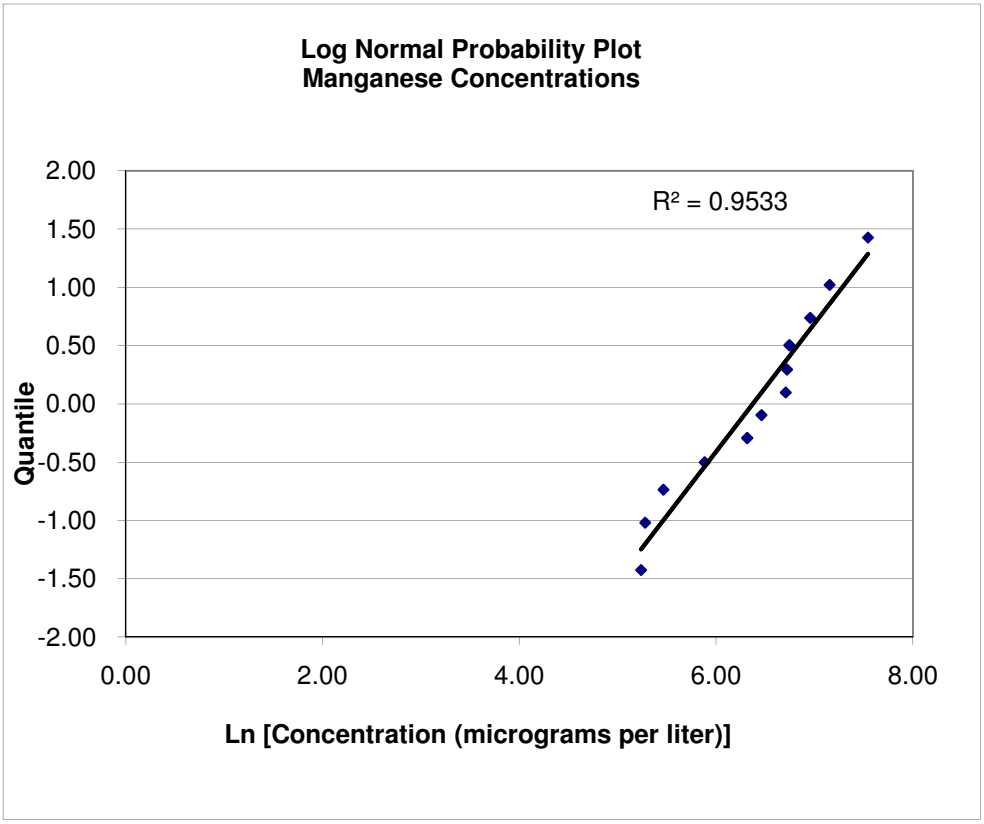
X(i)	LN[X(i)]	i	Rank	[Rank/(n+1)]	Quantiles
188	5.24	1	1	0.077	-1.43
196	5.28	2	2	0.154	-1.02
236	5.46	3	3	0.231	-0.74
359	5.88	4	4	0.308	-0.50
553	6.32	5	5	0.385	-0.29
640	6.46	6	6	0.462	-0.10
819	6.71	7	7	0.538	0.10
830	6.72	8	8	0.615	0.29
850	6.75	9	9	0.692	0.50
1050	6.96	10	10	0.769	0.74
1280	7.15	11	11	0.846	1.02
1890	7.54	12	12	0.923	1.43

Plot analysis indicates that the data more closely follow a normal distribution in the log-transformed format.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Manganese**





JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Determination of reported background value as an outlier

Analyte: **Manganese**

Background Data

Sample No.	Sample Date	Location	ln(Concentration) (ug/l)		Quantitation Limit (ug/l)
1	27-Apr-10	MW-6	B Flagged	B	50
2	19-Mar-09	MW-8	6.721		50
3	22-Apr-09	MW-8	5.236		50
4	14-May-09	MW-8	5.278		50
5	08-Oct-09	MW-8	5.464		50
6	19-Mar-09	MW-10S	5.883		50
7	22-Apr-09	MW-10S	6.315		50
8	14-May-09	MW-10S	6.461		50
9	08-Oct-09	MW-10S	6.957		50
10	19-Mar-09	P-19S	7.155		50
11	22-Apr-09	P-19S	6.745		50
12	14-May-09	P-19S	6.708		50
13	08-Oct-09	P-19S	7.544		50
		mean =	6.372		
		STD =	0.755		

Note: All concentrations are micrograms per liter

Using the data listed above, form the statisitc Tn:

Tn = (Xn - mean) / STD

where: Xn = largest observed sample value
mean = mean of the background values
STD = standard deviation of the background values

For Xn = 7.544
mean = 6.372
STD = 0.755

Tn = 1.553

From Table 8 included in the Staistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance, the critical value for the given sample group is

Number of samples = 12
Tc = 2.285

Since Tc>Tn, the sample result is not considered to be an outlier

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Shapiro Wilk Test Statistic (W) for normality of total **Manganese**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	188	1890	1702	0.5475	931.85
2	196	1280	1084	0.3325	360.43
3	236	1050	814	0.2347	191.05
4	359	850	491	0.1586	77.87
5	553	830	277	0.0922	25.54
6	640	819	179	0.0303	5.42
7	819	640	-179		
8	830	553	-277		
9	850	359	-491		
10	1050	236	-814		
11	1280	196	-1084		
12	1890	188	-1702		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 1592.16
SD = standard deviation of the data group = 502.85
n = number of samples = 12

W = 0.911

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.859
and the calculated W = 0.911

Therefore the data set is Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Parametric Tolerance Interval for normally distributed data

Analyte: **Manganese**

Background Data

Sample No.	Sample Date	Location	Concentration (ug/l)		Quantitation Limit (ug/l)
1	27-Apr-10	MW-6	B flagged	B	50.0
2	19-Mar-09	MW-8	830		50.0
3	22-Apr-09	MW-8	188		50.0
4	14-May-09	MW-8	196		50.0
5	08-Oct-09	MW-8	236		50.0
6	19-Mar-09	MW-10S	359		50.0
7	22-Apr-09	MW-10S	553		50.0
8	14-May-09	MW-10S	640		50.0
9	08-Oct-09	MW-10S	1050		50.0
10	19-Mar-09	P-19S	1280		50.0
11	22-Apr-09	P-19S	850		50.0
12	14-May-09	P-19S	819		50.0
13	08-Oct-09	P-19S	1890		50.0

Note: All sample concentrations are micrograms per liter

Using the background data, the upper Tolerance Limit can be determined using:

Upper Tolerance Limit = (Mean Concentration) + K x (Standard Deviation Samples)

where: Mean Conc = mean concentration background samples
K = factor for constructing one sided normal tolerance limit taken from table 4-2, page 87, Statistical Methods for Groundwater Monitoring, Gibbons, 1994
n = number of background samples
STDS = Standard Deviation Samples

For:
n = 12
K = 2.736
Mean Conc = 740.92
STDS = 502.85

UTL = 2,117 µg/L

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Analyte: **Zinc**

Sample No.	Sample Date	Location	Concentration		Quantitation Limit	Sorted Concentration	
1	27-Apr-10	MW-6	ND		10.0	32.3	161
2	19-Mar-09	MW-8	161		10.0	34.9	39.2
3	22-Apr-09	MW-8	34.9		10.0	39.2	34.9
4	14-May-09	MW-8	32.3		10.0	161	32.3
5	08-Oct-09	MW-8	39.2		10.0		
6	19-Mar-09	MW-10S	11.0	B	10.0		
7	22-Apr-09	MW-10S	5.9	B	10.0		
8	14-May-09	MW-10S	4.0	B	10.0		
9	08-Oct-09	MW-10S	14.0	B	10.0		
10	19-Mar-09	P-19S	4.1	B	10.0		
11	22-Apr-09	P-19S	3.8	B	10.0		
12	14-May-09	P-19S	1.2	B	10.0		
13	08-Oct-09	P-19S	1.9	B	10.0		

Number of Data: 5
Number of Truncated Data: 1
Percentage of Truncated Data: 20%

Non-Parametric Prediction Interval: 161 µg/L

- All concentrations in micrograms per liter (µg/L).
- B = Blank qualified data not used in statistical calculations.
- Background data included from MW-8, MW-10S, and P-19S.
- Background well MW-6.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Zinc**

Complete the following table where

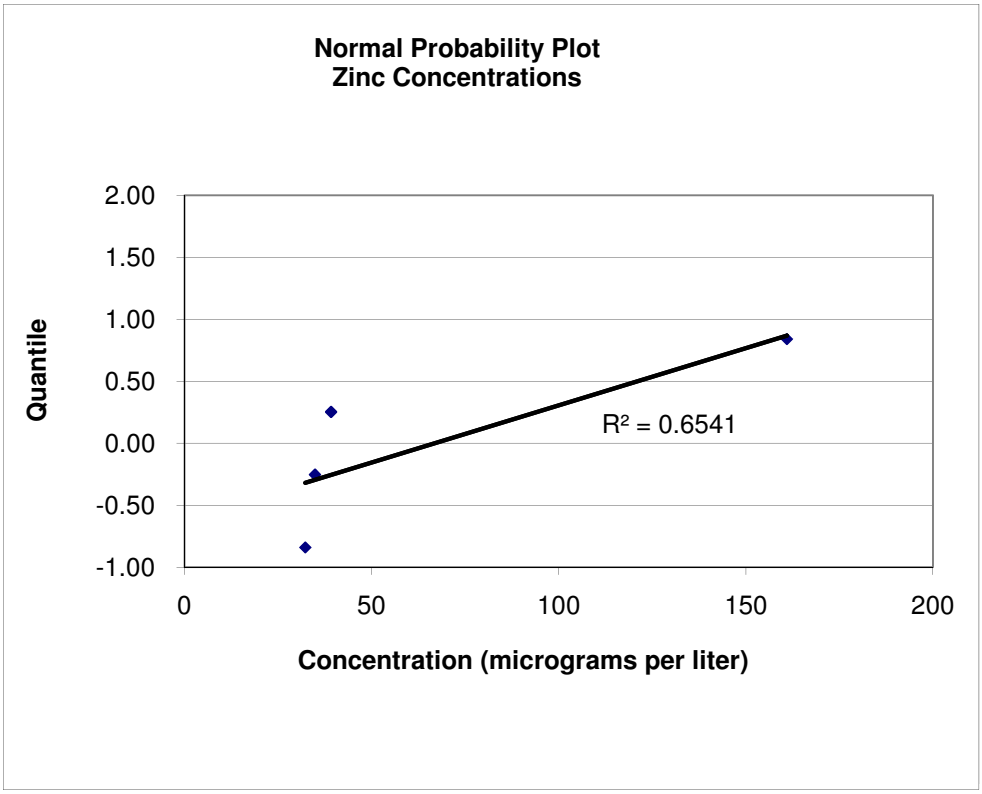
i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
LN[X(i)] = Natural Log Value of sample concentrations arranged from smallest to largest
[i/(n+1)] = Cumulative probability
n = number of samples = 4

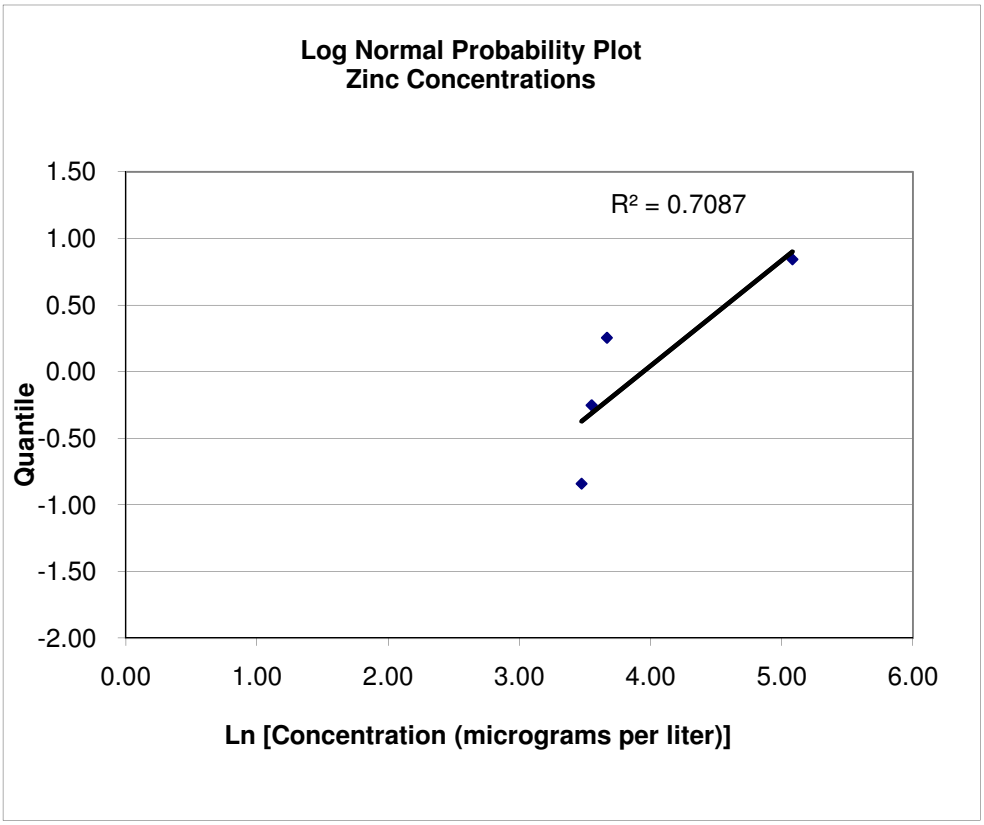
X(i)	LN[X(i)]	i	Rank	[Rank/(n+1)]	Quantiles
32.3	3.48	1	1	0.200	-0.84
34.9	3.55	2	2	0.400	-0.25
39.2	3.67	3	3	0.600	0.25
161	5.08	4	4	0.800	0.84

Plot analysis indicates that the data more closely follow a normal distribution in the log-transformed format.

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Probability Plots to determine the distribution of **Zinc**





JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Determination of reported background value as an outlier

Analyte: **Zinc**

Background Data

Sample No.	Sample Date	Location	ln(Concentration) (ug/l)		Quantitation Limit (ug/l)
1	27-Apr-10	MW-6	ND		10.0
2	19-Mar-09	MW-8	5.081		10.0
3	22-Apr-09	MW-8	3.552		10.0
4	14-May-09	MW-8	3.475		10.0
5	08-Oct-09	MW-8	3.669		10.0
6	19-Mar-09	MW-10S	B flagged	B	10.0
7	22-Apr-09	MW-10S	B flagged	B	10.0
8	14-May-09	MW-10S	B flagged	B	10.0
9	08-Oct-09	MW-10S	B flagged	B	10.0
10	19-Mar-09	P-19S	B flagged	B	10.0
11	22-Apr-09	P-19S	B flagged	B	10.0
12	14-May-09	P-19S	B flagged	B	10.0
13	08-Oct-09	P-19S	B flagged	B	10.0
		mean =	3.944		
		STD =	0.762		

Note: All concentrations are micrograms per liter

Using the data listed above, form the statisitc Tn:

Tn = (Xn - mean) / STD

where: Xn = largest observed sample value
mean = mean of the background values
STD = standard deviation of the background values

For Xn = 5.081
mean = 3.944
STD = 0.762

Tn = 1.492

From Table 8 included in the Staistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Interim Final Guidance, the critical value for the given sample group is

Number of samples = 5
Tc = 1.672

Since Tc>Tn, the sample result is not considered to be an outlier

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **27-Apr-10**

Shapiro Wilk Test Statistic (W) for normality of total **Zinc**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	32	161	128.7	0.6872	88.44
2	35	39	4.3	0.1677	0.72
3	39	35	-4.3		
4	161	32	-128.7		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 89.16
SD = standard deviation of the data group = 62.83
n = number of samples = 4

W = 0.671

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.748
and the calculated W = 0.671

Therefore the data is Non-Normal

JEI Project: **Coble's Sandrock - C&D Landfill**
Project No: **419.1000.12**
Task No: **01**
Date: **04/27/10**

Shapiro Wilk Test Statistic (W) for log normality of total **Zinc**

Complete the following table where

i = ordered value of sample, arranged from smallest to largest
X(i) = sample values arranged from smallest to largest
X(n-i+1) = sample values arranged from largest to smallest
A(n-i+1) = coefficient from table A-1, Statistical Analysis of Ground-Water Data at RCRA Facilities
B(i) = summation of (X(n-i+1)-X(i))A(n-i+1)

i	X(i)	X(n-i+1)	X(n-i+1) - X(i)	A(n-i+1)	B(i)
1	3.48	5.08	1.61	0.6872	1.10
2	3.55	3.67	0.12	0.1677	0.02
3	3.67	3.55	-0.12		
4	5.08	3.48	-1.61		

The test statistic W can be found using:

W = SQR[B/(SD x SQRT(n-1))]

where:
B = summation of (X(n-i+1)-X(i))A(n-i+1) = 1.12
SD = standard deviation of the data group = 0.76
n = number of samples = 4

W = 0.724

Compare this value to the critical value in Table A-2 of Statistical Analysisof Ground-Water Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance (Draft) July, 1992, to determine if the data is normally distributed.

From Table A-2 with (n) samples and a 95% confidence level, the critical value is

W(crit) = 0.748
and the calculated W = 0.724

Therefore the data is Non-Normal