[redacted] ☐ 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):

Sherrill Environmental, Inc.

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

Name: John (Jack) Sherrill, LG Phone: 919-493-6555

E-mail: sherrill@nc.rr.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Swift Creek Coal Combustion By-Products Structural Fill	Highway 301 Battleboro, NC Nash County			December 17, 2014

Environmental Status: (Check all that apply)

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

Type of data submitted: (Check all that apply)

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

Notification attached?

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

Certification

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

Sherrill Environmental, Inc., John Sherrill, LG — President — 919-493-6555

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

John Sherrill 2/10/15

Signature — Date

Affix NC Licensed/Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 1459 GEOLOGIST JOHN F. SHERRILL, III

3326 Rugby Rd., Durham, NC 27707

Facility Representative Address

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

Revised 6/2009

NOTIFICATION OF EXCEEDANCE OF A REPORTING LIMIT
SWIFT CREEK CCB STRUCTURAL FILL
December 17, 2014

Summary of Environmental Samples with Detections above SWSLs			
	Concentration	SWLS	
MW-1S	ug/L	ug/L	
Barium	408	100	
Sulfate	310,000	250,000	
MW-2S			
Barium	200	100	
MW-3			
Barium	151	100	
Sulfate	760,000	250,000	
MW-4			
Cadmium	1.7	1	
Mercury	1.11	0.2	
Sulfate	260,000	250,000	
MW-6			
Arsenic	98.7	10	
Barium	155	100	
Lead	122	10	
Sulfate	660,000	250,000	
MW-7			
Arsenic	167	10	
Barium	205	100	
Lead	553	10	
Sulfate	710,000	250,000	
MW-8			
Arsenic	124	10	
Barium	143	100	
Lead	263	10	
Sulfate	620,000	250,000	
SW-1	None		
SW-2	None		
SW-3	None		

SHERRILL ENVIRONMENTAL, INC

NOTIFICATION OF EXCEEDANCE OF A STANDARD
SWIFT CREEK CCB STRUCTURAL FILL
December 17, 2014

Summary of Environmental Samples with Exceedances		
	Concentration	Standard
	ug/L	ug/L
MW-1S		
Sulfate	310,000	250,000
MW-3		
Sulfate	760,000	250,000
MW-4		
Mercury	1.11	1.0
MW-6		
Arsenic	98.7	10
Lead	122	15
Sulfate	660,000	250,000
MW-7		
Arsenic	167	10
Lead	553	15
Sulfate	710,000	250,000
MW-8		
Arsenic	124	10
Lead	263	15
Sulfate	620,000	250,000

The above listed constituents are believed to be the result of materials in the structural fill. These constituents are not detected in the surface water samples from the creek/swamp that is the receptor of groundwater from the site. These results are consistent with historical data.

SHERRILL ENVIRONMENTAL, INC

Assessment Monitoring Report
December 17, 2014
Swift Creek Project
Highway 301

Nash County
Rocky Mount, North Carolina

February 10, 2015

Prepared by:
Sherrill Environmental, Inc.
3326 Rugby Road
Durham, NC 27707
(919) 493-6555

SHERRILL
ENVIRONMENTAL, INC
environmental & geologic services

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1.0 INTRODUCTION

Sherrill Environmental, Inc. (Sherrill) was contracted to perform Semi-Annual Groundwater and Surface Water Monitoring at the Swift Creek Project. The Swift Creek Project is a "Beneficial Use" fill utilizing coal combustion by-products (CCBs) in the development of a commercial property. The Project is located on the east side on US Highway 301 at Swift Creek near Battleboro, North Carolina (Figure 1). As determined by a review of historical DOT aerial photographs the property was previously developed as a motel with a restaurant (1961). A 1981 aerial photograph shows the project area to consist of the motel and restaurant with the remaining portion of the project area in agricultural use.

On November 11, 1991, ReUse Technology, Inc. submitted a letter to the Solid Waste Management Section seeking approval to use coal ash as structural fill material in the development of 25 acres of commercial property along Highway 301 at Swift Creek. On December 3, 1991, the Solid Waste Section issued a letter to ReUse that stated "Based upon the information received, the project appears to meet the guidelines previously agreed to for such reuse." In September 1992, ReUse began placement of coal ash at the site. In January 2003, the last shipment of coal ash was accepted at the site. According to records of Full Circle Solutions, Inc., a total of approximately 134,000 tons of CCBs were placed at the project. On March 23, 2003, the site had been graded, compacted, covered with an 18 inch soil cap and planted with grass seed. On November 4, 2004, the Closure Notice was forwarded to the Solid Waste Section. In March 2006, a Comprehensive Site Assessment (CSA) for the Swift Creek Project was submitted to the Solid Waste Section. In December 2006, an Assessment Monitoring Plan was submitted to the Solid Waste Section. On February 22, 2007, the Assessment Monitoring Plan was approved by the Solid Waste Section.

Eight sampling events have indicated that groundwater associated with the deeper monitoring wells (MW-1D, MW-2D, MW-5D) have not shown any impact from the CCB structural fill. The deeper wells were not sampled for this sampling event.

2.0 CORRECTIVE MEASURES

A corrective measure designed by Appian Consulting Engineers, P.A. consisting of a longitudinal subsurface drain along the western portion of the site was completed in January 2008. The purpose of the measure is to intercept groundwater flowing from west to east and therefore reduce the groundwater level in the area of the site. To monitor the effectiveness of the corrective measure, two piezometers (P-23 and P-24) were installed at 20 feet east and west of the cut-off drain. These piezometers monitor the effect of the cut-off drain in reducing the groundwater level at the project. The location of the cut-off drain (6" Lateral Subsurface Drain) and the piezometers are shown on the site map (Figure 2).

On July 24, 2014, David Wasiela, PE, with Environmental Resource Management (ERM), performed a site inspection of the Swift Creek project. Mr. Wasiela examined the manhole that contained the discharge valve of the lateral drain system. Mr. Wasiela found the manhole to be filled with approximately 2 feet of water and the discharge valve was not observable. Mr. Wasiela reported this condition to Sherrill Environmental, Inc.

Sherrill contacted Ed Braswell & Sons, Inc. (Braswell) that had originally installed the manhole and discharge valve. On August 20, 2014, Braswell pumped water out of the manhole and cleaned the interior with a high pressure water jet. Inspection of the valve indicated that it was working properly. On the outside of the manhole, they found that silt and mud had covered over the outlet, thus preventing the water from the subdrain to discharge. Braswell suggested having an engineer look at possibly moving the manhole and valve further upgradient to help prevent silt and mud from collecting in front of the outlet. At the present time, the corrective measure of the lateral drain is again functioning as designed.

3.0 SITE GEOLOGY

The site surficial geology consists of an alluvial terrace constructed by the fluvial deposition of silts, sands and gravels. The sequence coarsens downward with some coarse sand with gravel present near the base. The terrace deposit overlies the massive and extensive Yorktown Formation. The Yorktown Formation is Pliocene in age and was deposited in the Pliocene Yorktown Sea that covered the entire coastal plain and the eastern most portions of the Piedmont. Depositional environments were back barrier lagoons, shallow inner-bay and estuarine environments and on the open shallow shelf (The Geology of the Carolinas, Horton and Zullo, 1991). The Yorktown in the region of the site is generally described as blueish-gray fine to very fine, silty sands, sandy silt or silty clay, well-sorted and very shelly.

3.1 SOIL SURVEY

Figure 1-2 shows the location of the site on Sheet 1 of the Soil Survey of Nash County produced by the US Department of Agriculture, Soil Conservation Service. The soils underlying the coal ash fill project are largely Altavista with a smaller portion of Norfolk in the area of higher topography on the southern end of the site.

Altavista soils are alluvial deposits that formed on flood plains. These old flood plains were erosionally dissected and the remaining terrace areas are now topographically higher than the surrounding stream and swamps. The seasonal high water table for Altavista is 1.5 to 2.5 feet below the top of the soil surface and occurs during December through March.

The Soil Survey describes Altavista sandy loam (AaA) as moderately well drained and nearly level to gently sloping. It is on low terraces along large streams. Typically, the surface layer is grayish brown sandy loam 12 inches thick. The next layer, to a depth of 14 inches is olive yellow sandy loam that has yellow mottles. The subsoil extends to a depth of 44 inches. It is yellow sandy clay loam in the upper part. The middle part is yellowish brown clay loam that has mottles of light gray, red, and yellowish red. The lower part of the subsoil is light yellowish brown clay loam that has mottles of red, yellowish red, strong brown and light gray. The underlying material to a depth of 60 inches is mottled brownish yellow, light gray, strong brown and yellowish red sandy clay loam.

Permeability tests on site samples of the Altavista subsoil were performed by Geotechnologies, Inc. in April 2003. Permeability values for the three samples ranged from 1E-7 cm/sec to 7E-8 cm/sec. This information was presented in Sherrill's "Site Investigation" report prepared in May 2003.

The Norfolk soils underlie the site along the western and southern sides in the topographically higher portions of the site. The percentage of Norfolk soil underlying the coal ash fill is relatively small compared to the Altavista. The seasonal high water table for Norfolk is 4 to 6 feet below ground surface and occurs during January through March.

The Soil Survey describes Norfolk loamy sand (NoB) as well drained and gently sloping. It is on convex ridges and side slopes of the Coastal Plain uplands. Typically the surface layer is grayish brown loamy sand about 10 inches thick. The subsurface layer is very pale brown sandy loam to a depth of about 19 inches. The subsoil extends to a depth of at least 79 inches. It is brownish yellow sandy clay loam in the upper part. The middle part is brownish yellow sandy clay loam that has red and very pale brown mottles, and the lower part is a mottled brownish yellow, yellow, red and gray sandy loam.

3.2 MONITORING WELLS

A total of 11 monitoring wells are located around the perimeter of the Swift Creek Project (Figure 2). Monitoring wells MW-1S (shallow) and MW-1D (deep) are paired monitoring wells located near the center of the project approximately 25 feet east from the edge of the CCB fill. The MW-1S is completed in alluvial sediments and MW-1D is completed in the deeper marine sediments of the Yorktown Formation.

The paired monitoring wells MW-2S (shallow) and MW-2D (deep) are constructed similar to the MW-1 pair. The MW-2 pair is located on a roadway constructed into the swamp and is approximately 160 feet downgradient from the edge of the CCB fill and 135 feet downgradient of MW-1S and MW-1D.

Another paired monitoring well set, MW-5S (shallow) and MW-5D (deep), is located upgradient of the Swift Creek Project on the west side of US Highway 301. Again, the construction of this monitoring well set is similar with the shallow well screened in alluvial sandy sediments and the deeper well screened in the massive marine sediments.

Monitoring wells MW-3, MW-4, MW-6, MW-7 and MW-8 are shallow wells located at the southeast, southwest, northwest and northeast corners of the project. The borings were advanced through the alluvial material until the underlying marine unit was encountered as determined by split-spoon sampling. The alluvial material varied from a silty fine sand and clayey silty fine sand in the upper portion that generally coarsened downward. Borings at MW-5S, MW-6, MW-7 and MW-8 encountered medium to coarse quartz sand above the contact with the underlying marine unit.

All of the eleven borings were completed using 2-inch schedule 40 PVC with 10-foot slotted screens. The monitoring wells were completed with stick-up casing and 4-inch schedule 40 PVC protective casings with lockable caps.

3.3 SLUG-TEST ANALYSIS (From March 2006 CSA)

On January 8, 2006, Sherrill performed single-well slug-tests at the site on the shallow monitoring wells MW-2S, MW-5S and MW-7 and the deep monitoring wells MW-2D and MW-5D. The tests were performed by pumping water from the monitoring well and then recording the rate of recovery (rising head). The data was analyzed using the US Geological Survey, Open-File Report 02-197 *Documentation of Spreadsheets for the Analysis of Aquifer-Test and Slug-Test Data*. The Bouwer and Rice method was chosen for analysis of the data.

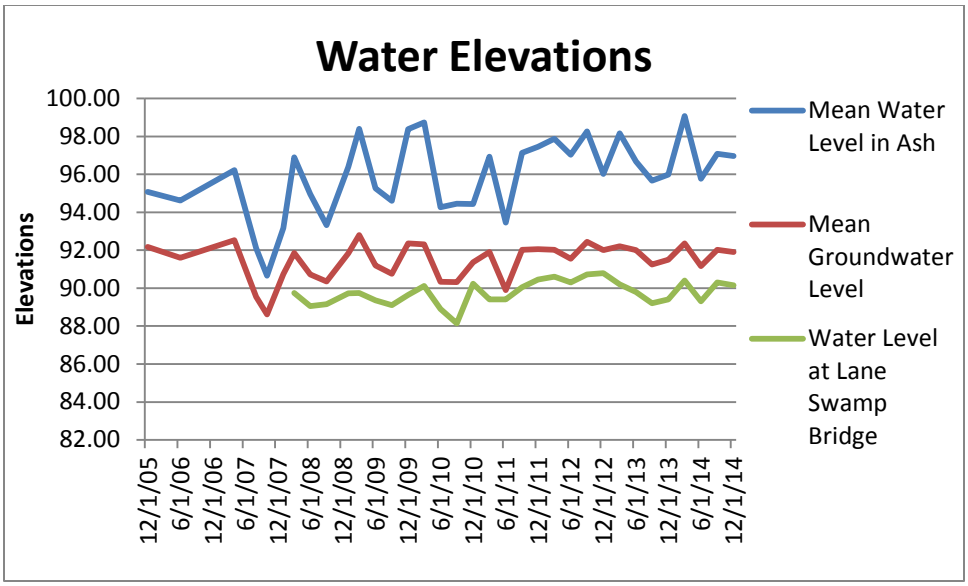
The analysis of the data revealed a large contrast in the hydraulic conductivity of the two geologic units. The overlying alluvial terrace deposit consisted of layers and mixtures of silt, clay, fine sand, medium sand, coarse sand and gravel. The terrace deposit at the site ranged in thickness from approximately 16 feet at the southwest (MW-4) and thinned towards the swamp to a thickness of approximately 8 feet (MW-2S). The percentage of sand and the grain size appeared to increase at lower elevations to the north and northeast (MW-6 and MW-7). The bottoms of the shallow monitoring well were placed at the contact with the top of the marine sediments and screen the lower 10 feet of the alluvial material. Hydraulic conductivities (K) of the tests conducted for MW-1S and MW-5S were very similar and ranged from 0.34 to 0.43 feet per day (1.2E-4 to 1.5E-4 cm/sec). Hydraulic conductivity of the test conducted for MW-7, which has 6 feet of clean sand, was 1.40 feet per day (4.8 E-04 cm/sec).

The deep monitoring wells, MW-1D and MW-5D are screened approximately 10 to 20 feet below the top of the marine sediments. The marine sediments are part of the Yorktown Formation and consist of a massive and uniformed, very shelly, greenish-gray silty very fine sand. Hydraulic conductivities for the deep wells were similar and ranged from 0.0017 to 0.0026 feet per day (6.1E-7 to 9.0E-7 cm/sec) and averaged 0.0022 feet per day (7.6E-7 cm/sec).

Seepage velocities were calculated for groundwater movement in the west to east direction with data from MW-5S and MW-2S for alluvial material and MW-5D and MW-2D for marine sediments (Table 3). Seepage velocities were estimated at 0.0166 feet per day for alluvial material and 0.00009 feet per day for marine sediments.

4.0 GROUNDWATER TABLE

The average groundwater elevation as measured in the shallow site monitoring wells from 2005 to 2014 is 91.49 feet with a standard deviation of 0.95 feet. The average water elevation as measured in piezometers screened in the coal ash fill (P-12 through P-20) from 2005 to 2014 is 93.74 feet with a standard deviation of 2.29 feet. The average surface water level measured at the Lane Swamp Bridge is 89.76 feet with a standard deviation of 0.63 feet. Surface water levels in Lane Swamp can be affected by beaver activity.



The corrective measure of the longitudinal subsurface drain along the western portion of the site was completed in January 2008. The corrective measure did not appear to have a significant effect on lowering the site groundwater table but appears to have reduced the amount of fluctuation. Before the drain was installed the average shallow groundwater elevation was 91.15 feet with a standard deviation of 1.66 feet. After installation of the drain, the average shallow groundwater elevation was 91.67 feet with a standard deviation of 0.73 feet. The longitudinal subsurface drain did not appear to have an effect on the water elevations in the CCB fill. The difference in the water elevation in the CCB fill and the elevation of the shallow groundwater table suggests that they are not connected. The separation is; however, not complete as evident from the detection of CCB related contaminants in the shallow groundwater table.

A map of the shallow groundwater table is shown on Figure 3. The map shows that the shallow groundwater flow is in an east northeast direction.

5.0 SAMPLE COLLECTION

On December 17, 2015, the site monitoring wells were sampled using low-flow sampling procedures and a peristaltic pump. The indicator field parameters of pH, temperature, specific conductivity, dissolved oxygen and oxidation/reduction potential (ORP) were measured using a flow-through-cell and a YSI multi-parameter meter. Turbidity measurements were taken with a Hach meter. Measurements were recorded on groundwater sampling field data work sheets which are included in the Appendix.

Samples were collected into laboratory prepared glassware, placed in an iced cooler and transferred to Enco Laboratories in Cary, North Carolina. Groundwater samples were analyzed for the Division's requested parameters of sulfate and total RCRA metals.

6.0 GROUNDWATER ANALYSIS

The analytical results for this and the previous groundwater sampling event are summarized on Table 3 and the laboratory report is included in the Appendix. Exceedances of the NCAC 2L Groundwater Standard were detected in the groundwater samples from the shallow monitoring wells MW-1S, MW-3, MW-4, MW-6, MW-7 and MW-8 (Figure 4). No exceedance of the 2L Groundwater Standard was detected in the groundwater samples from the shallow upgradient monitoring well MW-5S or the shallow downgradient monitoring well MW-2S located in the swamp. The analytical laboratory (Enco) reported that samples for MW-1S, MW-3, MW-6, MW-7 and MW-8 were diluted due to matrix interference. This resulted in elevated reporting limits for the RCRA metals.

Arsenic – The 2L Standard for arsenic is 0.010 mg/L. Arsenic was detected in three groundwater samples. Arsenic was detected in a concentration of 0.098 mg/L at MW-6, 0.167 mg/L at MW-7 and 0.124 mg/L at MW-8.

Cadmium – The 2L Standard for cadmium is 0.002. Cadmium was detected in a concentration of 0.0017 mg/L in the sample from MW-4.

Lead – The 2L Standard for lead is 0.015 mg/L. Lead concentrations that exceeded the 2L Standard have typically been limited to the northeast portion of the site. Lead concentrations were 0.122 mg/L at MW-6, 0.553 mg/L at MW-7 and 0.263 mg/L at MW-8.

Mercury – The 2L Standard for mercury is 0.001 mg/L. Mercury was detected in a concentration of 0.0011 mg/L in the sample from MW-4.

Sulfate – The 2L Standard for sulfate is 250 mg/L. Concentrations of sulfate were detected above the 2L Standard in all of the downgradient shallow perimeter monitoring wells. Sulfate concentrations in the southern wells were 310 mg/L at MW-1S, 760 mg/L at MW-3 and 260 mg/L at MW-4. Sulfate concentrations in the northern wells were 660 mg/L at MW-6, 710 mg/L at MW-7 and 620 mg/L at MW-8.

Barium – The 2L Standard for barium is 0.700 mg/L. Barium was detected above the NC Solid Waste Section Limit (SWSL) of 0.100 mg/L in samples from 7 of the 8 downgradient monitoring wells. None of the concentrations of barium exceeded the 2L Standard.

7.0 SURFACE WATER ANALYSIS

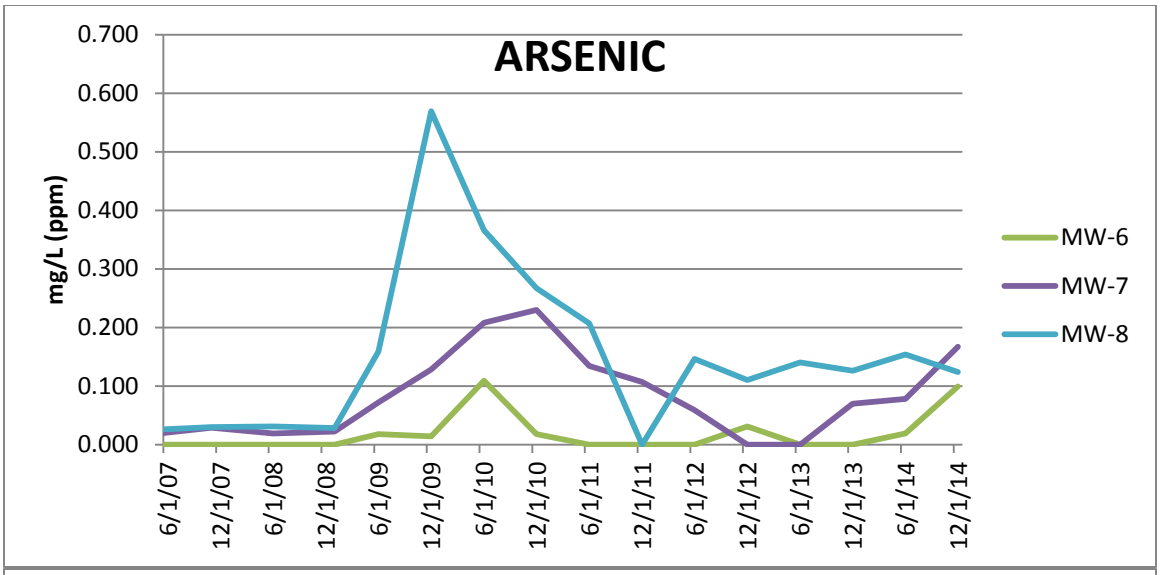
The analytical results for this and the previous surface water sampling events are summarized on Table 4. No RCRA metals were detected in exceedance of the 2B Surface Standard or above the NC Solid Waste Section Limit (SWSL). Sulfate concentrations were less than 5.0 mg/L at SW-1, 5.5 mg/L at SW-2 and 9.9 mg/L at SW-3. In summary, surface water analysis did not identify any contamination.

9.0 DISCUSSION AND SUMMARY

Exceedances of the 2L Groundwater Standard were detected in the samples from monitoring wells MW-1S, MW-3, MW-4, MW-6, MW-7 and MW-8. These wells monitor shallow groundwater downgradient of the CCB fill. No exceedance of a 2L Standard was detected in the upgradient monitoring well MW-5S or the downgradient monitoring well MW-2S. The deeper monitoring wells (MW-1D, MW-2D and MW-5D) were not sampled as it has been demonstrated that they are not in connection with the shallow site contamination.

The corrective measure of the longitudinal subsurface drain along the western portion of the site was completed in January 2008. The water elevations in the ash fill appear to have risen since the installation of the corrective measure. The elevation of groundwater appears to be approximately the same with a lower standard deviation suggesting that the subsurface drain has served to reduce site groundwater fluctuation. This data suggests a separation between the CCB fill and the shallow groundwater table. The separation is, however, not complete as evident from the detection of ash related contaminants in the shallow groundwater table. This information also suggests that the source of the water present in the CCB fill is from on-site precipitation.

The principal contaminants of interest at the site are arsenic, lead and sulfate. An increasing concentration trend of these contaminants had been identified at the monitoring wells located in the north and northeast during the period from 2009 to 2010. Note that the western longitudinal subsurface drain was installed in January 2008. In August 2014, the subsurface drain was discovered to be not operational due to blockage at the discharge. The discharge valve was cleared. The recent increase in concentrations of lead, arsenic and sulfate in the northern wells may be related to the functioning of the subsurface drain. When the subsurface drain is operational, the drain may reduce the quantity of shallow groundwater flowing underneath the site and therefore the contaminants are more concentrated.


ARSENIC
mg/L (ppm)
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
6/1/07
12/1/07
6/1/08
12/1/08
6/1/09
12/1/09
6/1/10
12/1/10
6/1/11
12/1/11
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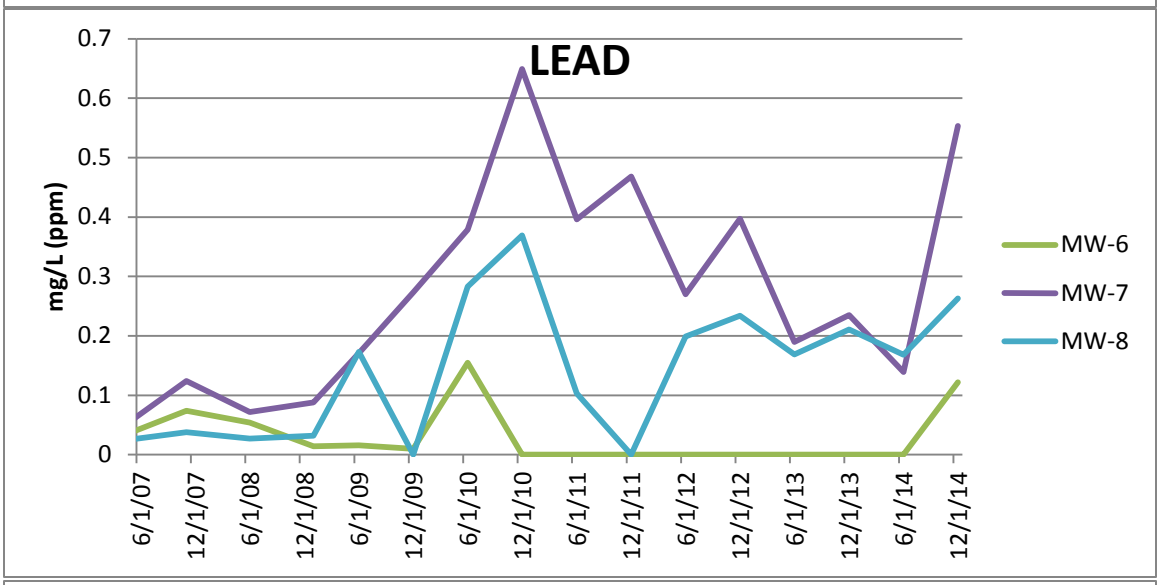
12/1/14
MW-6
MW-7
MW-8


LEAD
mg/L (ppm)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
6/1/07
12/1/07
6/1/08
12/1/08
6/1/09
12/1/09
6/1/10
12/1/10
6/1/11
12/1/11
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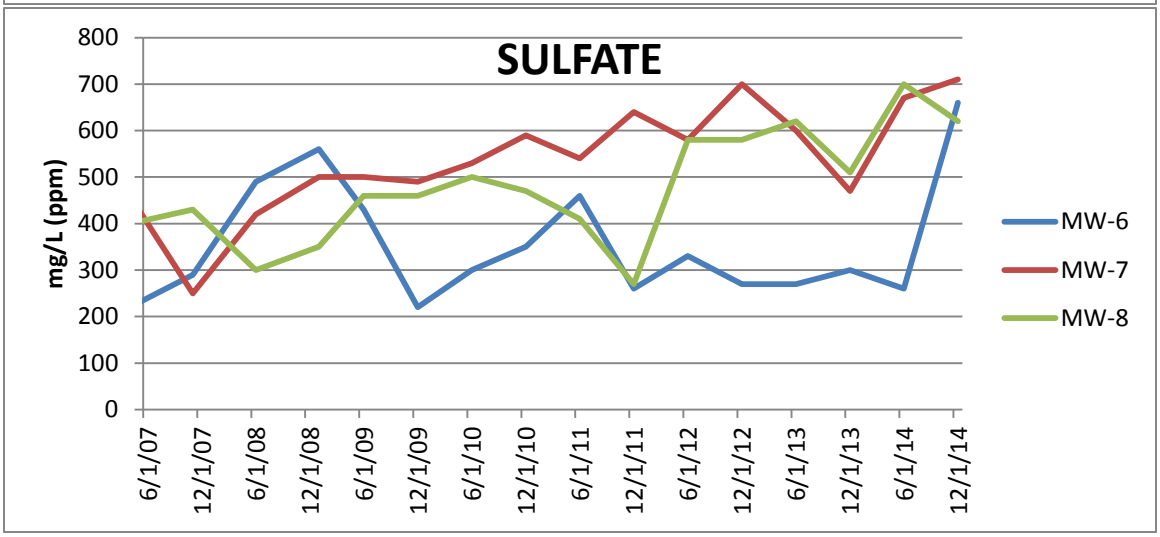
12/1/14
MW-6
MW-7
MW-8


SULFATE
mg/L (ppm)
800
700
600
500
400
300
200
100
0
6/1/07
12/1/07
6/1/08
12/1/08
6/1/09
12/1/09
6/1/10
12/1/10
6/1/11
12/1/11
6/1/12
12/1/12
6/1/13
12/1/13
6/1/14
12/1/14
MW-6
MW-7
MW-8

Mercury was detected in a concentration of 0.0011 mg/L in the groundwater sample from MW-4. This concentration is above the NCAC 2L Groundwater Standard of 0.001 mg/L for mercury. Low concentrations of mercury have previously been detected at MW-4 at 0.0006 mg/L in 6/30/2010, 0.00078 mg/L in 6/25/2013 and 0.00101 mg/L in 7/22/2014. Scattered low detections of mercury are present in the database but the concentrations rarely exceed the 2L Standard.

In summary, some shallow groundwater contamination is present adjacent and downgradient of the CCB fill. The contamination appears limited vertically as has been shown by no contaminants detected in the deeper monitoring wells. The contamination appears limited to the east side of Highway 301 as no contaminants have been detected in the upgradient shallow and deep pair of monitoring wells MW-5S and MW-5D on the west side of Highway 301. The direction of groundwater flow is to the east and northeast. No contamination has been detected at MW-2S or MW-2D which are located on a roadway constructed into the swamp and is approximately 160 feet downgradient from the edge of the CCB fill. The shallow groundwater associated with the site is likely to discharge to the surface water of Lane Creek Swamp and the Swift Creek Swamp. Analysis of surface water samples has not indicated any contamination. No receptors are identifiable for this site and the low level of contamination attenuates as it migrates from the project area into the adjacent swamp.

10.0 RECOMMENDATIONS

Sherrill recommends continuing with the Assessment Monitoring. The next quarterly event for measuring water levels is scheduled for March 2015. The next semiannual event for measuring water levels and collecting groundwater and surface water samples is scheduled for June 2015. Sherrill recommends that an inspection of the manhole/valve box associate with the corrective measure of the lateral drain be conducted on a quarterly basis to insure that it is functioning properly.

TABLES

TABLE 1
GROUNDWATER ELEVATIONS
SWIFT CREEK PROJECT

Sherrill Environmental, Inc.

	MW-1S	MW-3	MW-4	MW-6	MW-7	Average	MW-2S	MW-5S	MW-8	MW-1D	MW-2D	MW-5D	Lane Swamp
	Shallow On-Site Wells						Shallow Off-Site Wells			Deep Wells			
TOC ELV.	99.54	102.15	106.06	98.41	98.63		94.87	102.68	95.42	99.90	95.22	102.67	92.25
12/1/2005	8.21	9.65	11.24	7.17	7.63		4.72	6.01		8.57	4.70	6.40	
GW ELV.	91.33	92.50	94.82	91.24	91.00	92.18	90.15	96.67		91.33	90.52	96.27	
1/8/2006	8.11	9.48	10.15	7.18	7.74		NM	5.86		8.28	NM	5.68	
GW ELV.	91.43	92.67	95.91	91.23	90.89	92.43		96.82		91.62		96.99	
6/9/2006	8.69	10.32	11.41	7.74	8.66		4.83	6.94		9.05	4.87	6.84	
GW ELV.	90.85	91.83	94.65	90.67	89.97	91.59	90.04	95.74		90.85	90.35	95.83	
4/4/2007	7.80	9.31	9.96	7.28	7.80		4.40	6.12	4.84	8.18	4.75	5.96	
GW ELV.	91.74	92.84	96.10	91.13	90.83	92.53	90.47	96.56	90.58	91.72	90.47	96.71	
8/21/2007	10.89	11.40	13.28	10.80	10.71		6.77	9.57	7.67	11.30	6.82	9.42	
GW ELV.	88.65	90.75	92.78	87.61	87.92	89.54	88.10	93.11	87.75	88.60	88.40	93.25	
10/21/2007	11.40	12.98	14.06	11.90	11.41		7.31	10.62	8.30	11.76	7.43	10.63	
GW ELV.	88.14	89.17	92.00	86.51	87.22	88.61	87.56	92.06	87.12	88.14	87.79	92.04	
1/31/2008	9.13	10.70	14.11	8.44	8.71		4.86	7.65	5.57	9.42	5.02	8.11	
GW ELV.	90.41	91.45	91.95	89.97	89.92	90.74	90.01	95.03	89.85	90.48	90.20	94.56	
3/22/2008	8.10	9.18	13.28	7.18	7.79		4.40	6.98	4.78	8.44	4.54	7.34	2.51
GW ELV.	91.44	92.97	92.78	91.23	90.84	91.85	90.47	95.70	90.64	91.46	90.68	95.33	89.74
6/17/2008	9.12	10.54	14.05	8.36	9.06		5.03	8.93	6.09	9.42	5.23	8.92	3.20
GW ELV.	90.42	91.61	92.01	90.05	89.57	90.73	89.84	93.75	89.33	90.48	89.99	93.75	89.05
9/4/2008	9.26	10.98	14.82	8.92	9.06		4.58	10.87	5.97	9.47	5.02	10.72	3.10
GW ELV.	90.28	91.17	91.24	89.49	89.57	90.35	90.29	91.81	89.45	90.43	90.20	91.95	89.15
1/13/2009	8.22	9.35	13.41	7.02	7.60		4.26	7.16	4.58	8.55	4.46	7.54	2.52
GW ELV.	91.32	92.80	92.65	91.39	91.03	91.84	90.61	95.52	90.84	91.35	90.76	95.13	89.73
3/31/2009	7.60	6.74	12.43	6.81	7.20		4.36	5.98	4.21	7.96	4.38	6.22	2.50
GW ELV.	91.94	95.41	93.63	91.60	91.43	92.80	90.51	96.70	91.21	91.94	90.84	96.45	89.75
6/23/2009	8.62	10.06	13.86	7.72	8.52		4.41	9.83	5.56	8.92	4.77	9.63	2.90
GW ELV.	90.92	92.09	92.20	90.69	90.11	91.20	90.46	92.85	89.86	90.98	90.45	93.04	89.35
9/30/2009	8.86	10.82	14.70	8.08	8.51		4.64	10.40	5.50	9.18	5.00	10.26	3.15
GW ELV.	90.68	91.33	91.36	90.33	90.12	90.76	90.23	92.28	89.92	90.72	90.22	92.41	89.10
12/15/2009	7.54	8.68	12.85	6.78	7.13		4.22	6.30	4.21	NM	NM	NM	2.60
GW ELV.	92.00	93.47	93.21	91.63	91.50	92.36	90.65	96.38	91.21				89.65
3/31/2010	7.37	8.64	12.52	6.77	7.93		2.42	5.80	3.96	7.74	4.46	6.19	2.14
GW ELV.	92.17	93.51	93.54	91.64	90.70	92.31	92.45	96.88	91.46	92.16	90.76	96.48	90.11
6/29/2010	9.35	10.66	14.62	9.21	9.25		4.94	9.97	6.31	NM	NM	NM	3.35
GW ELV.	90.19	91.49	91.44	89.20	89.38	90.34	89.93	92.71	89.11				88.90
9/28/2010	9.23	11.55	14.80	9.11	8.52		4.80	10.85	5.48	10.05	5.50	11.10	4.10
GW ELV.	90.31	90.60	91.26	89.30	90.11	90.32	90.07	91.83	89.94	89.85	89.72	91.57	88.15
12/13/2010	8.54	10.12	14.02	7.37	7.93		4.36	8.72	4.81	NM	NM	NM	2.02
GW ELV.	91.00	92.03	92.04	91.04	90.70	91.36	90.51	93.96	90.61				90.23
3/28/2011	8.03	9.17	13.32	7.25	7.53		4.35	7.45	4.42	8.42	4.67	7.84	2.85
GW ELV.	91.51	92.98	92.74	91.16	91.10	91.90	90.52	95.23	91.00	91.48	90.55	94.83	89.40
6/26/2011	10.05	11.23	14.82	9.20	9.98		6.02	10.59	7.04	10.35	6.32	10.43	2.85
GW ELV.	89.49	90.92	91.24	89.21	88.65	89.90	88.85	92.09	88.38	89.55	88.90	92.24	89.40
9/28/2011	7.84	8.90	13.09	7.13	7.71		4.24	7.62	4.83	NM	NM	NM	2.20
GW ELV.	91.70	93.25	92.97	91.28	90.92	92.02	90.63	95.06	90.59				90.05
12/18/2011	8.00	8.88	13.10	6.98	7.53		4.32	7.35	4.47	8.35	4.65	7.70	1.80
GW ELV.	91.54	93.27	92.96	91.43	91.10	92.06	90.55	95.33	90.95	91.55	90.57	94.97	90.45
3/23/2012	8.01	8.89	13.01	7.03	7.75		4.31	7.35	4.80	8.35	4.56	7.66	1.65
GW ELV.	91.53	93.26	93.05	91.38	90.88	92.02	90.56	95.33	90.62	91.55	90.66	95.01	90.60
6/28/2012	8.39	9.40	13.38	7.42	8.45		4.65	8.52	5.63	8.72	4.92	8.54	1.95
GW ELV.	91.15	92.75	92.68	90.99	90.18	91.55	90.22	94.16	89.79	91.18	90.30	94.13	90.30
9/18/2012	7.41	8.21	12.73	6.82	7.37		4.16	7.21	4.51	7.86	4.50	7.45	1.52
GW ELV.	92.13	93.94	93.33	91.59	91.26	92.45	90.71	95.47	90.91	92.04	90.37	95.22	90.73
12/17/2012	8.04	9.19	13.36	6.82	7.37		NM	8.55	4.51	8.44	NM	8.76	1.45
GW ELV.	91.50	92.96	92.70	91.59	91.26	92.00		94.13	90.91	91.46		93.91	90.80
3/26/2013	7.87	8.71	12.84	7.08	7.26		4.23	7.03	4.22	8.13	4.46	7.38	2.05
GW ELV.	91.67	93.44	93.22	91.33	91.37	92.21	90.64	95.65	91.20	91.77	90.41	95.29	90.20
6/25/2013	8.00	9.05	12.97	7.05	7.70		4.18	6.92	4.69	8.34	4.57	7.44	2.45
GW ELV.	91.54	93.10	93.09	91.36	90.93	92.00	90.69	95.76	90.73	91.56	90.30	95.23	89.80
9/26/2013	8.38	9.57	13.65	8.75	8.19		4.32	9.50	5.25	8.67	4.71	9.50	3.05
GW ELV.	91.16	92.58	92.41	89.66	90.44	91.25	90.55	93.18	90.17	91.23	90.16	93.17	89.20
12/4/2013	8.30	9.59	14.13	7.47	7.80		4.31	8.48	4.82	8.59	4.72	8.70	2.85
GW ELV.	91.24	92.56	91.93	90.94	90.83	91.50	90.56	94.20	90.60	91.31	90.15	93.97	89.40
3/28/2014	7.74	8.56	12.53	6.92	7.23		4.33	6.68	4.39	8.03	4.54	7.03	1.85
GW ELV.	91.80	93.59	93.53	91.49	91.40	92.36	90.54	96.00	91.03	91.87	90.33	95.64	90.40
6/27/2014	8.43	9.69	13.93	8.33	8.54		4.45	7.78	5.60	8.74	4.80	8.80	2.95
GW ELV.	91.11	92.46	92.13	90.08	90.09	91.17	90.42	94.90	89.82	91.16	90.07	93.87	89.30
9/26/2014	7.82	8.62	13.81	7.10	7.36		3.91	6.68	4.40	8.20	4.28	7.33	1.95
GW ELV.	91.72	93.53	92.25	91.31	91.27	92.02	90.96	96.00	91.02	91.70	90.59	95.34	90.30
12/17/2014	7.88	9.01	13.71	7.24	7.40		4.22	7.94	4.34	8.30	4.53	7.46	2.10
GW ELV.	91.66	93.14	92.35	91.17	91.23	91.91	90.65	94.74	91.08	91.60	90.34	95.21	90.15
		Average Groundwater Elevation				91.49		94.67	Average GW Elv. At MW-5S (upgradient)				
		Standard Deviation		(12/1/05-12/17/14)		0.95		1.61	Standard Deviation				
		Average Groundwater Elevation				91.15			Average SW Elv at Lane Swamp				89.76
		Standard Deviation		(12/1/05-10/21/07)		1.66			Standard Deviation				0.63
		Average Groundwater Elevation				91.67							
		Standard Deviation		(1/13/09-12/17/14)		0.73							

TABLE 2
PIEZOMETER WATER ELEVATIONS
SWIFT CREEK PROJECT

	P-12	P-13	P-14	P-15	P-16	P-17	P-18	P-19	P-20	Average	St. Dev.
12/1/05	96.00	96.71	93.08	93.83	93.64	94.23	95.12	98.41	94.61	95.07	1.70
6/10/06	95.93	97.23	91.60	92.19	92.89	93.80	95.51	97.82	94.66	94.63	2.19
9/25/06	97.92	98.89	93.43	94.75	94.16	95.11	97.04	99.56	95.24	96.23	2.19
8/21/07	93.11	95.09	88.16	90.18		88.59	93.67	94.80	93.20	92.10	2.74
10/22/07	91.60	93.45	87.67	87.09		87.69	93.07	93.11	91.54	90.65	2.72
1/31/08	94.47	94.43	89.93	92.15	91.13	93.96	93.33	94.93	94.20	93.17	1.72
3/22/08	97.84	98.56	95.17	96.47	95.00	94.93	95.64	102.24	96.27	96.90	2.37
6/17/08	96.04	97.04	92.68	91.66	93.58	94.14	94.99	99.23	95.25	94.96	2.30
9/4/08	94.89	95.19	90.66	90.96	NM	90.47	93.49	96.38	94.50	93.32	2.31
1/13/09	98.13	97.35	95.16	97.08	94.60	95.03	94.62	99.50	96.11	96.40	1.73
3/31/2009	100.94	101.09	96.72	98.12	95.58	95.29	96.51	104.45	96.98	98.41	3.09
6/23/2009	97.57	96.99	92.92	94.13	93.38	94.56	94.73	98.09	95.06	95.27	1.85
9/30/09	95.89	95.45	92.54	94.91	NM	94.43	93.35	95.56	94.73	94.61	1.15
12/15/09	100.42	100.53	96.16	98.51	NM	95.26	96.07	103.01	97.10	98.38	2.72
3/31/10	101.67	101.87	97.14	98.42	95.50	95.21	97.56	104.41	96.94	98.75	3.18
6/29/10	95.92	96.69	91.76	91.22	92.45	93.08	94.61	97.84	94.80	94.26	2.29
9/28/10	94.10	97.85	95.30	93.09	93.70	93.14	94.71	94.32	93.90	94.46	1.45
12/14/10	95.64	95.89	92.48	93.34	92.80	93.81	94.26	97.08	94.70	94.44	1.53
3/28/11	98.46	99.46	94.73	96.70	94.20	95.00	96.63	101.26	96.03	96.94	2.36
6/26/11	95.38	96.21	91.10	90.56	91.80	89.86	94.38	97.27	94.57	93.46	2.68
9/28/11	98.74	99.34	94.32	96.40		95.03	96.78	100.43	96.12	97.15	2.15
12/18/11	99.29	100.49	94.23	96.41		95.01	97.14	101.12	96.00	97.46	2.56
3/23/12	99.66	100.86	94.74	96.59		95.09	97.65	102.03	96.47	97.89	2.69
6/29/12	98.84	99.58	94.07	95.69		94.93	96.70	100.51	96.03	97.04	2.33
9/18/12	100.19	101.15	94.86	96.88		95.19	98.01	103.01	96.79	98.26	2.92
12/18/12	97.83	98.04	93.09	94.22		94.61	95.85	99.29	95.20	96.02	2.16
3/26/13	100.04	101.97	94.93	97.13		95.06	97.73	102.13	96.35	98.17	2.89
6/25/13	98.90	98.33	94.20	96.21		95.02	95.61	99.51	95.68	96.68	1.96
9/26/13	97.69	97.14	92.90	94.80		94.77	95.13	97.93	94.99	95.67	1.75
12/4/13	98.01	97.17	93.95	95.80		94.96	94.94	97.96	95.14	95.99	1.53
3/28/14	100.84	103.15	95.86	97.91		95.18	98.50	103.99	97.09	99.07	3.27
6/27/14	97.81	98.01	92.53	94.14		94.11	95.56	98.81	95.15	95.77	2.23
9/26/14	99.22	98.67	94.74	97.96		95.15	95.88	99.38	95.69	97.09	1.92
12/17/14	98.51	98.61	94.90	97.41		95.05	95.94	99.66	95.67	96.97	1.82
Average										95.93	1.99
	Average Water Elevation in Ashfill (12/05 to 10/07)					93.74					
	Standard Deviation					2.29					
		Average Water Elevation in Ashfill (3/08 to 6/27/14)					96.42				
		Standard Deviation					1.62				

TABLE 3
SUMMARY OF GROUNDWATER ANALYSES
SWIFT CREEK PROJECT

		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Sulfate
NCAC	**2L Std.**	0.01	0.7	0.002	0.01	0.015	0.02	0.02	0.001	250
NCDWM	**SWSL**	0.01	0.1	0.001	0.01	0.01	0.01	0.01	0.0002	250
MW-1S	6/7/04	**0.028**	0.190	<0.001	<0.01	**0.068**	<0.01	<0.01	<0.0002	**490**
	12/1/05	**0.020**	0.170	<0.001	<0.01	**0.042**	<0.01	<0.01	<0.0002	**608**
	6/10/06	**0.012**	0.472	<0.001	<0.01	**0.052**	<0.01	<0.01	0.00064	**740**
	4/5/07	<0.01	0.458	<0.001	<0.01	<0.010	<0.01	<0.01	0.00047	**420**
	11/15/07	<0.01	0.529	<0.001	<0.01	**0.031**	<0.01	<0.01	0.00089	**520**
	6/18/08	<0.01	0.619	<0.001	<0.01	0.011	<0.01	<0.01	0.00051	**470**
	1/14/09	<0.01	0.416	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	210
	6/24/09	<0.01	0.412	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	220
	12/16/09	<0.01	0.256	0.001	<0.01	<0.010	**0.022**	<0.01	<0.0002	160
	6/30/10	**0.012**	0.691	0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	**280**
	12/14/10	<0.01	0.599	**0.003**	<0.01	<0.010	<0.01	<0.01	<0.0002	**400**
	6/27/11	<0.10	0.475	<0.01	<0.10	<0.10	<0.10	<0.10	<0.00028	**590**
	12/19/11	<0.050	0.422	<0.005	<0.050	<0.050	<0.050	<0.050	<0.0002	170
	6/29/12	<0.01	0.419	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	150
	12/18/12	**0.018**	0.567	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	180
	6/25/13	<0.01	0.174	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	75
	12/4/13	<0.01	0.163	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	99
	6/27/14	<0.01	0.250	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	110
	12/17/14	<0.01	0.408	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**310**
MW-1D	6/7/04	<0.01	0.540	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	13
	12/1/05	<0.01	0.360	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	7.7
	6/10/06	<0.01	0.341	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	20
	4/5/07	<0.01	0.343	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	12
	10/22/07	<0.01	0.365	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	11
	6/18/08	<0.01	0.334	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	14
	1/14/08	<0.01	0.356	NR	NR	<0.010	NR	NR	<0.0002	14
	6/24/09	<0.01	0.403	NR	NR	<0.010	NR	NR	<0.0002	20
MW-2S	6/22/04	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	32
	12/1/05	<0.01	0.180	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	10.1
	6/10/06	<0.01	0.198	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	4/5/07	<0.01	0.232	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	4.4
	10/22/07	<0.01	0.256	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	3.6
	6/18/08	<0.01	0.103	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	4.4
	1/14/09	<0.01	0.164	NR	NR	<0.010	NR	NR	<0.0002	<5
	6/24/09	<0.01	0.173	NR	NR	<0.010	NR	NR	<0.0002	<5
	12/16/09	<0.01	0.218	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	<5
	6/30/10	<0.01	0.229	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	<5
	12/14/10	<0.01	0.235	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	<5
	6/27/11	<0.01	0.182	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	<5
	12/19/11	<0.01	0.216	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	<5
	6/29/12	<0.01	0.178	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	<5
	6/25/13	<0.01	0.210	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/4/13	<0.01	0.199	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	6/27/14	<0.01	0.165	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/17/14	<0.01	0.200	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
MW-2D	6/22/04	<0.01	0.170	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	5.6
	12/1/05	<0.01	0.300	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	3.1
	6/10/06	<0.01	0.290	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	11
	4/5/07	<0.01	0.254	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	2.9
	10/22/07	<0.01	0.273	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	4.8
	6/18/08	<0.01	0.265	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	22
	1/14/09	<0.01	0.253	NR	NR	<0.010	NR	NR	<0.0002	16
	6/24/09	<0.01	0.289	NR	NR	<0.010	NR	NR	<0.0002	6.3

TABLE 3
SUMMARY OF GROUNDWATER ANALYSES
SWIFT CREEK PROJECT

		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Sulfate
NCAC	**2L Std.**	0.01	0.7	0.002	0.01	0.015	0.02	0.02	0.001	250
NCDWM	**SWSL**	0.01	0.1	0.001	0.01	0.01	0.01	0.01	0.0002	250
MW-5S	12/1/05	<0.01	0.450	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	6.1
	6/10/06	<0.01	0.121	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	7
	4/5/07	<0.01	0.218	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	4.7
	10/22/07	<0.01	0.278	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	4.9
	6/18/08	<0.01	0.046	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	8.7
	1/14/09	<0.01	0.051	NR	NR	<0.010	NR	NR	<0.0002	10
	6/24/09	<0.01	0.058	NR	NR	<0.010	NR	NR	<0.0002	13
	12/16/09	<0.01	0.056	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	17
	6/30/10	<0.01	0.057	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	12
	12/14/10	<0.01	0.102	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	14
	6/27/11	<0.01	0.064	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	17
	12/19/11	<0.01	0.087	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	21
	6/29/12	<0.01	0.095	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	22
	12/18/12	<0.01	0.131	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	25
	6/25/13	<0.01	0.025	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	22
	12/4/13	<0.01	0.088	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	21
	6/27/14	<0.01	0.052	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	14
	12/17/14	<0.01	0.082	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	21
MW-5D	12/1/05	<0.01	0.170	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	8.1
	6/10/06	<0.01	0.236	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	6
	4/5/07	<0.01	0.227	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	5.8
	10/22/07	<0.01	0.258	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	6.6
	6/18/08	<0.01	0.254	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	10
	1/14/09	<0.01	0.255	NR	NR	<0.010	NR	NR	<0.0002	10
	6/24/09	<0.01	0.261	NR	NR	<0.010	NR	NR	<0.0002	17
MW-3	12/1/05	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**334**
	6/10/06	<0.01	0.192	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**580**
	4/5/07	<0.01	0.342	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	**570**
	11/15/07	<0.01	0.133	<0.001	<0.01	**0.036**	<0.01	<0.01	<0.0002	**380**
	6/18/08	<0.01	0.145	<0.001	<0.01	**0.022**	<0.01	<0.01	<0.0002	**370**
	1/14/09	<0.01	0.144	<0.001	<0.01	0.013	<0.01	<0.01	<0.0002	**550**
	6/24/09	<0.01	0.202	<0.001	<0.01	**0.081**	<0.01	<0.01	<0.0002	**570**
	12/16/09	**0.012**	0.192	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	**710**
	6/30/10	**0.011**	0.094	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	**840**
	12/14/10	<0.01	0.125	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	**690**
	6/27/11	<0.10	0.119	<0.01	<0.10	<0.10	<0.10	<0.10	<0.0002	**790**
	12/19/11	<0.01	0.234	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**410**
	6/29/12	<0.01	0.125	<0.001	<0.01	<0.01	<0.05	<0.01	<0.0002	**1,000**
	12/18/12	**0.013**	0.136	<0.001	<0.01	<0.01	0.011	<0.01	<0.0002	**910**
	6/25/13	<0.10d	0.201	<0.01d	<0.1d	<0.1d	<0.1d	<0.1d	<0.0002	**950**
	12/4/13	<0.050d	0.162	<0.005d	<0.05d	<0.05d	<0.05d	<0.05d	<0.0002	**890**
	6/27/14	<0.027d	0.116	<0.002d	<0.07d	<0.01d	<0.025d	<0.07d	<0.0002	**970**
	12/17/14	<0.050d	0.151	<0.005d	<0.05d	<0.05d	<0.05d	<0.05d	<0.0002	**760**

TABLE 3
SUMMARY OF GROUNDWATER ANALYSES
SWIFT CREEK PROJECT

		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Sulfate
NCAC	**2L Std.**	0.01	0.7	0.002	0.01	0.015	0.02	0.02	0.001	250
NCDWM	**SWSL**	0.01	0.1	0.001	0.01	0.01	0.01	0.01	0.0002	250
MW-4	12/1/05	<0.01	0.460	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	5.7
	6/10/06	<0.01	0.171	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	4/5/07	<0.01	<0.100	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	8.6
	10/22/07	<0.01	0.147	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	5.9
	6/18/08	<0.01	0.198	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	5.4
	1/14/09	<0.01	0.083	NR	NR	<0.010	NR	NR	<0.0002	6.4
	6/24/09	<0.01	0.349	NR	NR	<0.010	NR	NR	<0.0002	7.7
	12/16/09	<0.01	0.121	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	7.5
	6/30/10	<0.01	0.181	<0.001	0.018	<0.010	<0.01	<0.01	0.0006	15
	12/14/10	**0.016**	0.195	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	16
	6/27/11	<0.01	0.227	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	28
	12/19/11	<0.01	0.516	**0.003**	<0.01	**0.021**	<0.01	<0.01	<0.0002	51
	6/29/12	<0.01	0.356	**0.008**	<0.01	**0.032**	<0.01	<0.01	<0.0002	100
	12/18/12	<0.01	0.262	**0.019**	<0.01	**0.095**	<0.01	<0.01	<0.0002	220
	6/25/13	<0.01	0.109	**0.004**	<0.01	**0.021**	<0.01	<0.01	0.00078	**250**
	12/4/13	<0.01	0.167	**0.006**	<0.01	<0.010	<0.01	<0.01	<0.0002	130
	7/22/14	<0.01	0.085	0.0017	<0.01	<0.010	<0.01	<0.01	**0.00101**	190
	12/17/14	<0.01	0.071	0.0017	<0.01	<0.010	<0.01	<0.01	**0.00111**	**260**
MW-6	12/1/05	<0.01	1.300	<0.001	<0.01	0.01	<0.01	<0.01	<0.0002	174
	6/10/06	<0.01	0.816	<0.001	<0.01	0.013	<0.01	<0.01	<0.0002	**510**
	4/5/07	<0.01	0.312	<0.001	<0.01	**0.032**	<0.01	<0.01	<0.0002	220
	11/15/07	<0.01	0.120	<0.001	<0.01	**0.074**	<0.01	<0.01	0.00026	**290**
	6/18/08	<0.01	0.080	<0.001	<0.01	**0.054**	<0.01	<0.01	0.00091	**490**
	1/14/09	<0.01	0.066	NR	NR	0.014	NR	NR	<0.0002	**560**
	6/24/09	0.018	0.155	NR	NR	**0.016**	NR	NR	0.00026	**430**
	12/16/09	**0.014**	0.126	<0.001	<0.01	0.010	<0.01	<0.01	<0.0002	220
	6/30/10	**0.109**	0.313	<0.001	<0.01	**0.155**	<0.01	<0.01	0.0003	**300**
	12/14/10	**0.018**	0.138	<0.001	<0.01	<0.010	<0.01	<0.01	<0.0002	**350**
	6/27/11	<0.10	0.717	<0.01	<0.10	<0.10	<0.10	<0.10	0.00095	**460**
	12/19/11	<0.01	0.148	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**260**
	6/29/12	<0.05	0.156	<0.001	<0.01	<0.01	<0.05	<0.01	<0.0002	**330**
	12/18/12	**0.031**	0.131	<0.001	<0.01	<0.01	0.012	<0.01	<0.0002	**270**
	6/25/13	<0.01	0.152	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**270**
	12/4/13	<0.05d	0.247	<0.005d	<0.05d	<0.05d	<0.05d	<0.05d	<0.0002	**300**
	6/27/14	**0.0189**	0.193	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	**260**
	12/17/14	**0.099**	0.155	<0.005d	<0.05d	**0.122**	<0.05d	<0.05d	<0.0002	**660**

TABLE 3
SUMMARY OF GROUNDWATER ANALYSES
SWIFT CREEK PROJECT

		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Sulfate
NCAC	**2L Std.**	0.01	0.7	0.002	0.01	0.015	0.02	0.02	0.001	250
NCDWM	**SWSL**	0.01	0.1	0.001	0.01	0.01	0.01	0.01	0.0002	250
MW-7	12/1/05	0.038	<0.10	<0.001	<0.01	**0.093**	<0.01	<0.01	<0.0002	**379**
	6/10/06	0.03	0.059	<0.001	<0.01	**0.053**	<0.01	<0.01	<0.0002	**500**
	4/5/07	0.017	<0.100	<0.001	<0.01	**0.047**	<0.01	<0.01	0.0003	**460**
	11/15/07	0.029	<0.100	<0.001	<0.01	**0.124**	<0.01	<0.01	0.00072	**250**
	6/18/08	0.019	0.042	<0.001	<0.01	**0.072**	<0.01	<0.01	<0.0002	**420**
	1/14/09	0.022	0.052	<0.001	<0.01	**0.088**	<0.01	<0.01	<0.0002	**500**
	6/24/09	**0.072**	0.080	<0.001	<0.01	**0.171**	<0.01	<0.01	<0.0002	**500**
	12/16/09	**0.128**	0.123	<0.01	<0.01	**0.273**	<0.10	<0.10	0.0006	**490**
	6/30/10	**0.208**	0.172	<0.01	<0.01	**0.379**	<0.10	<0.10	0.0002	**530**
	12/14/10	**0.230**	0.255	<0.01	<0.01	**0.649**	<0.10	<0.10	0.00057	**590**
	6/27/11	**0.134**	0.159	<0.01	<0.10	**0.396**	<0.10	<0.10	0.00033	**540**
	12/19/11	**0.107**	0.172	<0.01	<0.10	**0.468**	<0.10	<0.10	<0.0002	**640**
	6/29/12	**0.059**	0.120	<0.005	<0.05	**0.270**	<0.05	<0.05	<0.0002	**580**
	12/18/12	**<0.100d**	0.158	<0.01	<0.10	**0.397**	<0.10	<0.10	<0.0002	**700**
	6/25/13	**<0.100d**	0.114	<0.01d	<0.10d	**0.190**	<0.10d	<0.10d	<0.0002	**600**
	12/4/13	**0.070**	0.119	<0.05d	<0.050d	**0.235**	<0.050d	<0.050d	<0.0002	**470**
	6/27/14	**0.078**	0.093	<0.002d	<0.007d	**0.139**	<0.025d	<0.010d	<0.0002	**670**
	12/17/14	**0.167**	0.205	<0.05d	<0.050d	**0.553**	<0.050d	<0.050d	<0.0002	**710**
MW-8	4/5/07	0.025	<0.100	<0.001	<0.01	**0.024**	<0.01	<0.01	<0.0002	**400**
	11/15/07	0.030	<0.100	<0.001	<0.01	**0.038**	<0.01	<0.01	<0.0002	**430**
	6/18/08	0.031	0.048	<0.001	<0.01	**0.027**	<0.01	<0.01	<0.0002	**300**
	1/14/09	0.028	0.039	NR	NR	**0.032**	NR	NR	<0.0002	**350**
	6/24/09	**0.159**	0.114	NR	NR	**0.173**	NR	NR	0.0003	**460**
	12/16/09	**0.569**	0.286j	<0.016	<0.050	**0.376j**	<0.135	<0.095	0.0002	**460**
	6/30/10	**0.366**	0.232	<0.016	<0.050	**0.283**	<0.135	<0.095	0.0002	**500**
	12/14/10	**0.267**	0.243	<0.01	<0.100	**0.369**	<0.100	<0.100	**0.0013**	**470**
	6/27/11	**0.207**	0.223	<0.01	<0.100	**0.103**	<0.100	<0.100	<0.0002	**410**
	12/19/11	<0.100	0.321	<0.01	<0.100	<0.100	<0.100	<0.100	<0.0002	**270**
	6/29/12	**0.146**	0.169	<0.005	<0.05	**0.199**	<0.05	<0.05	<0.0002	**580**
	12/18/12	**0.110**	0.168	<0.01	<0.100	**0.234**	<0.10	<0.10	<0.0002	**580**
	6/25/13	**0.140**	0.172	<0.01d	<0.100d	**0.169**	<0.10d	<0.10d	<0.0002	**620**
	12/4/13	**0.126**	0.177	<0.05d	<0.050d	**0.211**	<0.050d	<0.050d	<0.0002	**510**
	6/27/14	**0.154**	0.130	<0.002d	<0.007d	**0.168**	<0.025d	<0.010d	<0.0002	**700**
	12/17/14	**0.124**	0.143	<0.05d	<0.050d	**0.263**	<0.050d	<0.050d	<0.0002	**620**
Concentrations in mg/L (ppm), "j" = estimated concentration, "d"= diluted, Specific Conductivity = mS/cm										
Bold values exceed the 2L Groundwater Standard										
MW-1S, MW-2S and MW-5S are screened shallow (approx. 3 to 13 feet).										
MW-1D, MW-2D, and MW-5D are screened deep (approx. 23 to 33 feet).										
MW-3, MW-4, MW-6 and MW-7 are shallow wells located on the SE, SW, NW and NE corners.										

TABLE 4
SUMMARY OF SURFACE WATER ANALYSES
SWIFT CREEK PROJECT

		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Sulfate
NCAC	**2B Std.**	0.05	1.0	0.002	0.05	0.025	0.005	0.06	0.000012	250
NCDWM	**SWSL**	0.01	0.1	0.001	0.01	0.01	0.01	0.01	0.0002	
SW-1	3/4/03	<0.01	<0.10	<0.001	<0.01	<0.005	<0.01	<0.01	<0.0002	12
	6/22/04	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<2.0
	12/1/05	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	6.3
	6/10/06	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	4/5/07	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	6.6
	10/22/07	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	3.8
	6/18/08	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	2.5
	1/14/09	<0.01	<0.10	NR	NR	<0.01	NR	NR	<0.0002	5.6
	6/24/09	<0.01	0.030	NR	NR	<0.01	NR	NR	<0.0002	<5
	12/16/09	<0.01	0.048	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	6.2
	6/30/10	<0.01	0.032	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/14/10	<0.01	0.025	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	6/27/11	<0.01	0.041	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/19/11	<0.01	0.025	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/18/12	<0.01	0.028	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	6/25/13	<0.01	0.040	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/4/13	<0.01	0.025	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	5.3
	6/27/14	<0.01	0.030	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/17/14	<0.01	0.027	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
SW-2	3/4/03	<0.01	<0.10	<0.001	<0.01	<0.005	<0.01	<0.01	<0.0002	13
	6/22/04	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<2.0
	12/1/05	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	10.2
	6/10/06	<0.01	0.090	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	4/5/07	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	3.5
	10/22/07	DRY								
	7/8/08	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	13
	1/14/09	<0.01	<0.10	NR	NR	<0.01	NR	NR	<0.0002	6.1
	6/24/09	<0.01	0.088	NR	NR	<0.01	NR	NR	<0.0002	<5
	12/16/09	<0.01	0.025	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	7.5
	6/30/10	DRY								
	12/14/10	<0.01	0.034	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	5.3
	6/27/11	DRY								
	12/19/11	<0.01	0.027	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/18/12	<0.01	0.031	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	6/25/13	<0.01	0.037	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/4/13	<0.01	0.023	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	5.3
	6/27/14	<0.01	0.038	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/17/14	<0.01	0.027	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	5.5

TABLE 4
SUMMARY OF SURFACE WATER ANALYSES
SWIFT CREEK PROJECT

		Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury	Sulfate
NCAC	**2B Std.**	0.05	1.0	0.002	0.05	0.025	0.005	0.06	0.000012	250
NCDWM	**SWSL**	0.01	0.1	0.001	0.01	0.01	0.01	0.01	0.0002	
SW-3	4/5/07	<0.01	<0.10	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	2.4
	10/22/07	DRY								
	6/18/08	<0.01	0.089	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	3.3
	1/14/09	<0.01	<0.10	NR	NR	<0.01	NR	NR	<0.0002	20
	6/24/09	<0.01	0.087	NR	NR	<0.01	NR	NR	<0.0002	<5
	12/16/09	<0.01	0.075	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	14
	6/30/10	<0.01	0.328	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	47
	12/14/10	<0.01	0.074	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	16
	6/27/11	DRY								
	12/19/11	<0.01	0.065	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	8
	12/18/12	<0.01	0.067	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	6.5
	6/25/13	<0.01	0.087	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	7.4
	12/4/13	<0.01	0.051	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	23
	6/27/14	<0.01	0.038	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	<5
	12/17/14	<0.01	0.08	<0.001	<0.01	<0.01	<0.01	<0.01	<0.0002	9.9

Concentrations in mg/L (ppm)
Bold values exceed the 2B Surface Water Standard
SW-1 Swift Creek at bridge (background).
SW-2 in swamp near MW-2S and MW-2D
SW-3 in Lane Swamp north of MW-8

TABLE 5
MONITORING WELL AND PIEZOMETER SUMMARY
SWIFT CREEK PROJECT

Piezometer	Top of Casing Elev.	Ground Surface Elev.	Casing Stick Up	Screen Interval	Total Depth (TOC)	Measured Total Depth 8/2007	Ash/Soil Contact	Ash/Soil Contact Elv.	Alluvial/ Marine contact Elv.	Comments
P-1	108.19	105.6	2.6	20-30	32.6		14.4	91.2		Missing
P-2	109.53	106.7	2.8	20-30	32.8	33.90	16.1	90.6		
P-3	106.18	104.4	1.8	18-28	30.0		12.5	91.9		
P-4	106.57	104.0	2.6	20-30	32.6		14.0	90.0		Damaged
P-5	108.39	105.9	2.5	20-30	32.5	32.57	13	92.9		
P-6	109.79	107.5	2.3	20-30	32.3	32.35	13.5	94.0		
P-7	107.77	105.9	1.9	30-40	41.9	42.30	14.3	91.6	82.9	Damaged
P-8	106.53	103.9	2.6	30-40	42.6	42.15	13.3	90.7	82.9	
P-9	103.32	100.9	2.4	20-30	32.4	32.87	Soil		87.0	Damaged
P-10	108.17	106.1	2.1	20-30	32.1		Soil		89.1	Removed
P-11	101.88	99.2	2.7	13-23	25.7		Soil		82.0	Removed
P-12	107.04	104.0	3.0	6-16	19.0	19.44	13.8	90.2		
P-13	108.99	105.9	3.1	6-16	19.1	19.16	13.3	92.7		
P-14	105.38	101.9	3.5	4-14	17.5	17.95	11.5	90.4		
P-15	103.76	101.0	2.8	4-14	16.8	16.85	11.1	89.9		
P-16	105.28	102.1	3.2	4-14	17.2		11.5	90.6		Damaged
P-17	105.31	101.8	3.5	4-14	17.5	17.93	11.5	90.3		
P-18	111.21	107.5	3.7	5-15	18.7	18.30	13.5	94.0		
P-19	111.86	108.3	3.6	7-17	20.6	20.00	15.2	93.1		
P-20	107.00	104.2	2.8	7-17	19.8	19.94	15.0	89.2		
P-21	104.99	99.5	5.5	4.5-11.5	16.5	16.60	9.5	90.0		
P-22	103.60	101.8	1.8	17-27	28.8		Soil		87.0	
P-23East	109.75	107.1	2.7	9-19	21.8		12.0	95.0	90.0	
P-24West	103.17	101.1	2.1	3-13	15.3		Soil		90.0	
B-1	107.66	105.7	2.0	14-19	21.0	19.40	13.5	92.2	88.9	1" casing
Monitoring Wells										
MW-1S	99.54	96.8	2.7	3-13	15.7				84.0	
MW-1D	99.90	97.1	2.8	23-33	35.7				84.0	
MW-2S	94.87	92.1	2.8	6-16	18.7				78.5	
MW-2D	95.22	92.2	3.0	26-36	39.1				78.5	
MW-3	102.15	99.2	3.0	7-17	20.0				82.2	
MW-4	106.06	104.1	2.0	8-18	20.0				89.1	
MW-5S	102.68	99.7	3.0	6-16	17.0				88.2	
MW-5D	102.67	99.8	2.9	25-35	37.9				88.2	
MW-6	98.41	95.0	3.4	6-16	19.4				79.0	
MW-7	98.63	95.1	3.5	6-16	19.5				79.0	Damaged by bullet
MW-8	95.42	92.4	3.0	6-16	19.0				76.4	

FIGURES

FULL CIRCLE SOLUTIONS, INC.
SWIFT CREEK PROJECT

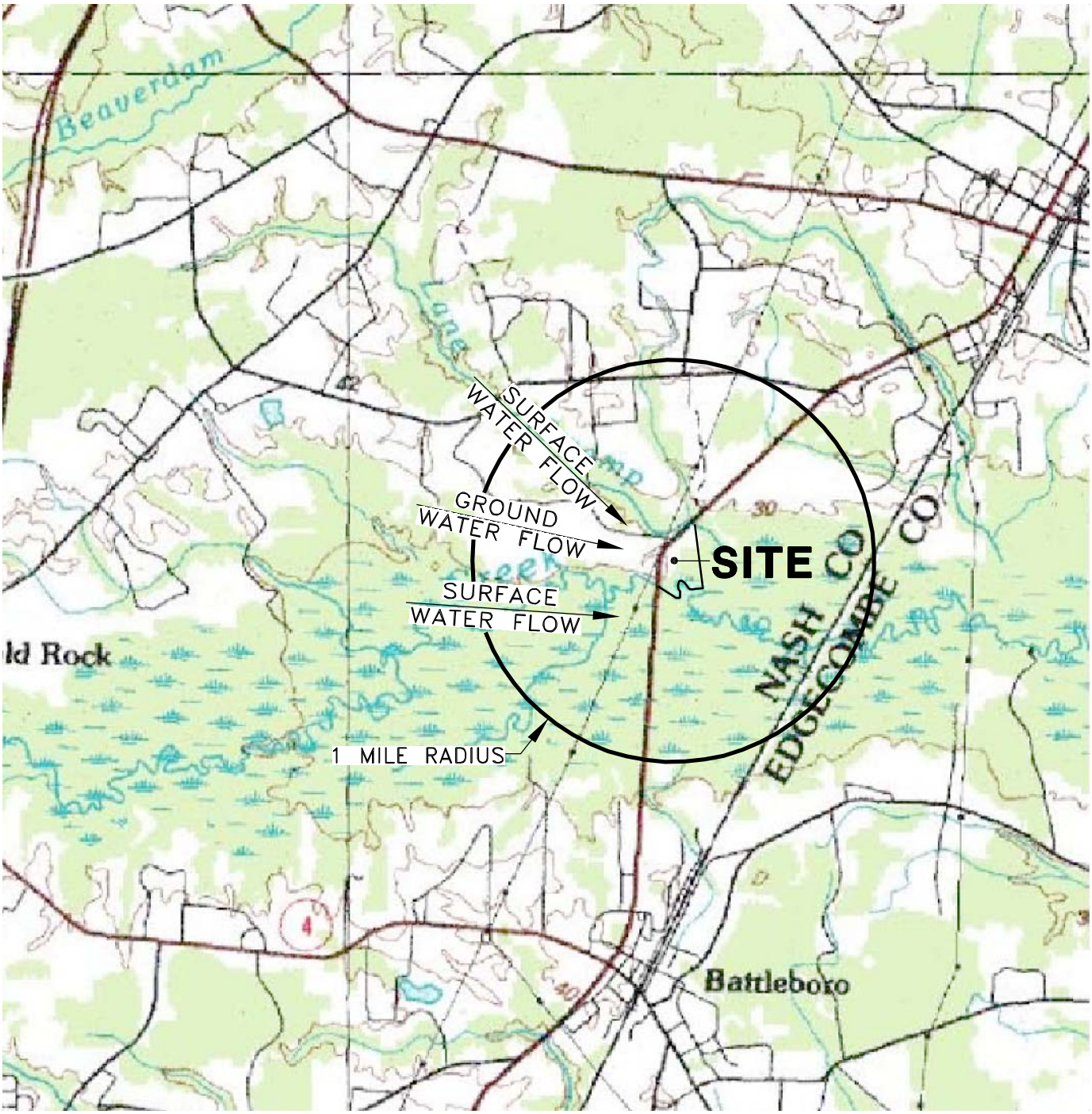


FIGURE 1
SITE LOCATON MAP

.\Sherrill logo.jpg
3326 Rugby Rd.
Durham N.C. 27707
Phone (919) 493-6555
sherrill@nc.rr.com

ACE JOB #: 01-060	Appian	DATE: 4-7-11
SCALE: 1"=4,000'		SHEET #: 1 OF 4

APPIAN CONSULTING ENGINEERS, P.A.
CIVIL, MUNICIPAL & STRUCTURAL ENGINEERS
COMPREHENSIVE ENVIRONMENTAL SERVICES
P.O. Box 7966 / Rocky Mount, N.C. 27804
Phone: (252) 972-7703 / Fax: (252) 972-7638
www.appianengineers.com

GENESIS 1:1

TRIANGLE ENVIRONMENTAL INC.
P.O. Box 41087
Raleigh, N.C. 27629
(919) 876-5115
(800) 849-5115
(919) 790-8273 fax

PROJECT :

Swift Creek Project

Soil Survey Map of Nash County, NC

PROJ. # 461-0109

DRWN BY :

SCALE : 1" = 2000'

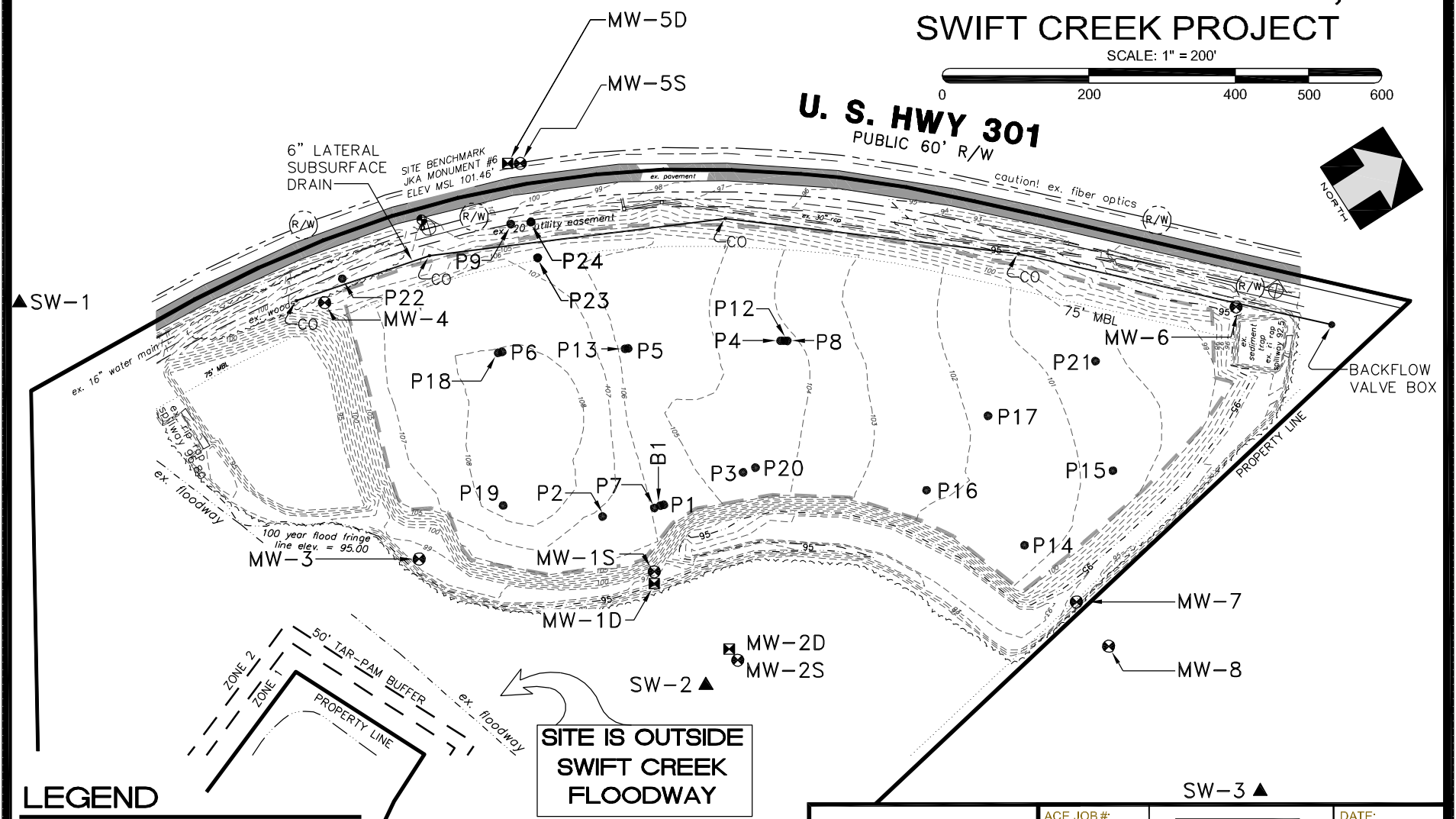
FIGURE : 1-2

FULL CIRCLE SOLUTIONS, INC.

SWIFT CREEK PROJECT

SCALE: 1" = 200'

0 200 400 500 600



LEGEND

- SHALLOW MONITORING WELL (ALLUVIAL TERRACE)
- DEEP MONITORING WELL (MARINE SEDIMENTS)
- PIEZOMETER
- SURFACE WATER LOCATION
- LIMITS OF ASH FILL PER PAUL ODEN WITH REUSE TECHNOLOGIES FEB. 21, 2003

FIGURE 2

SITE MAP

SHERRILL ENVIRONMENTAL, INC
environmental & geologic services
3326 Rugby Rd.
Durham N.C. 27707
Phone (919) 493-6555
sherrill@nc.rr.com

ACE JOB #: 01-060
SCALE: 1"=200'
DATE: 4-7-14
SHEET #: 2 OF 4

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GENESIS 1:1

C:\Users\Mike Gallina\Documents\mike\10060-REUSE-SWIFT\01060-1-20-15.dwg <FIG-3 (12-17-14)> 01/20/2015 - 9:51:02 AM

FULL CIRCLE SOLUTIONS, INC.

SWIFT CREEK PROJECT

SCALE: 1" = 200'

0 200 400 500 600

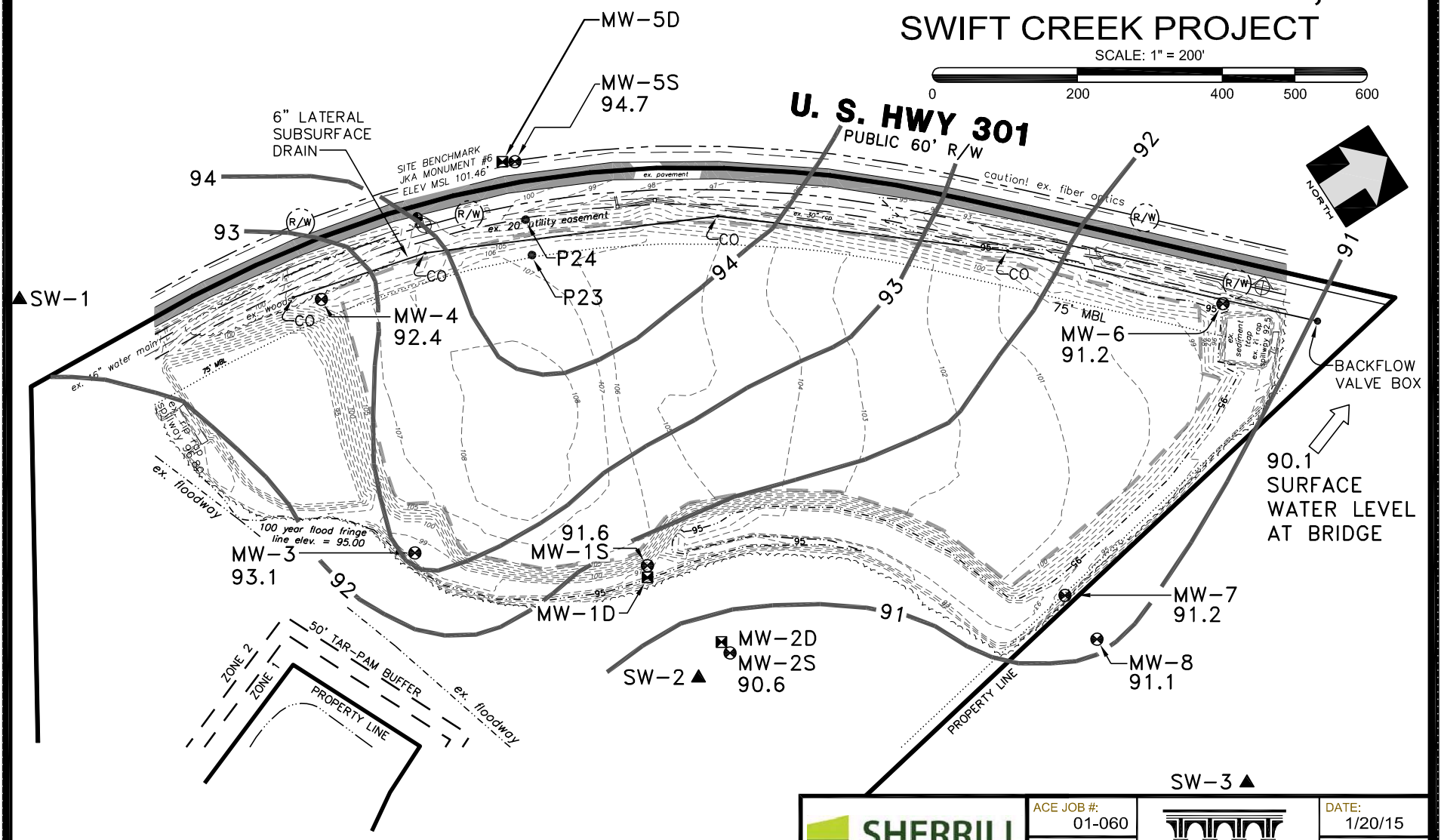

FIGURE 3

MAP OF GROUNDWATER TABLE

12/17/14

SHERRILL ENVIRONMENTAL, INC
environmental & geologic services
3326 Rugby Rd.
Durham N.C. 27707
Phone (919) 493-6555
sherrill@nc.rr.com

ACE JOB #:	DATE:
01-060	1/20/15
SCALE: 1"=200'	SHEET #: 3 OF 4

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Phone: (252) 972-7703 / Fax: (252) 972-7638
www.appianengineers.com

GENESIS 1:1

NOTE:
CONCENTRATIONS IN mg/L (ppm)
NS = NOT SAMPLED

FULL CIRCLE SOLUTIONS, INC.
SWIFT CREEK PROJECT

SCALE: 1" = 200'
0 200 400 500 600

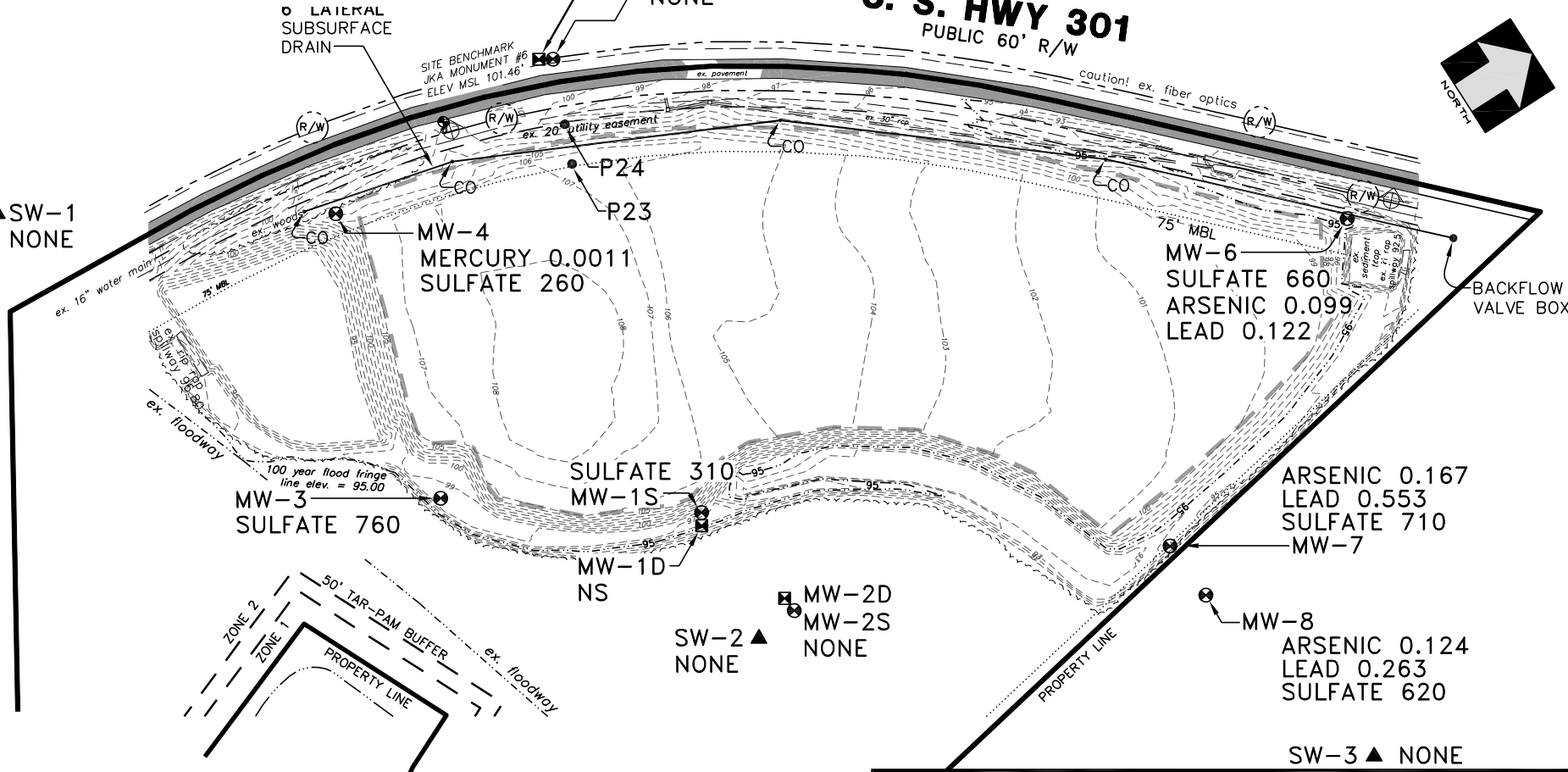

FIGURE 4
CONSTITUENTS EXCEEDING 2L GROUNDWATER STANDARDS 12/17/14

SHERRILL ENVIRONMENTAL, INC
environmental & geologic services
3326 Rugby Rd.
Durham N.C. 27707
Phone (919) 493-6555
sherrill@nc.rr.com

ACE JOB #:	DATE:
01-060	1/20/15
SCALE: 1"=200'	SHEET #: 4 OF 4

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Phone: (252) 972-7703 / Fax: (252) 972-7638
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APPENDIX

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

102-A Woodwinds Industrial Court
Cary NC, 27511
Phone: 919.467.3090 FAX: 919.467.3515

Monday, January 19, 2015
Sherrill Environmental, Inc. (SH004)
Attn: Jack Sherrill
3326 Rugby Road
Durham, NC 27707

RE: Laboratory Results for
Project Number: [none], Project Name/Desc: Swift Creek
ENCO Workorder(s): C416644

Dear Jack Sherrill,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Thursday, December 18, 2014.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Cary. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Stephanie Franz

Project Manager

Enclosure(s)

PROJECT NARRATIVE

Date: 19 January 2015
Client: Sherrill Environmental, Inc. (SH004)
Project: Swift Creek
Lab ID: C416644

Overview

This report is an amendment to the original report dated 05 January 2015 for this work order. This report was revised, to include a copy of the Chain of Custody with the report.

Environmental Conservation Laboratories, Inc. (ENCO) analyzed all submitted samples in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling by ENCO are discussed in the QC Remarks section below.

Quality Control Samples

No Comments

Quality Control Remarks

No Comments

Other Comments

The analytical data presented in this report are consistent with the methods as referenced in the analytical report. Any exceptions or deviations are noted in the QC remarks section of this narrative or in the Flags/Notes and Definitions section of the report.

Released By:
Environmental Conservation Laboratories, Inc.

Stephanie Franz
Project Manager

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

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SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: MW-1S **Lab ID: C416644-01** **Sampled: 12/17/14 12:53** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:06

Client ID: MW-1S **Lab ID: C416644-01RE1** **Sampled: 12/17/14 12:53** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:16	12/23/14 09:03
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 09:45

Client ID: MW-2S **Lab ID: C416644-02** **Sampled: 12/17/14 13:20** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:16	12/22/14 16:50
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 09:47
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:09

Client ID: MW-3 **Lab ID: C416644-03** **Sampled: 12/17/14 11:52** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:16	12/22/14 17:07

Client ID: MW-3 **Lab ID: C416644-03RE1** **Sampled: 12/17/14 11:52** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 12:08
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:36

Client ID: MW-4 **Lab ID: C416644-04** **Sampled: 12/17/14 12:20** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:16	12/22/14 17:58
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 09:56
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:13

Client ID: MW-5S **Lab ID: C416644-05** **Sampled: 12/17/14 11:27** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:16	12/22/14 18:15
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 10:10
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:15

Client ID: MW-6 **Lab ID: C416644-06** **Sampled: 12/17/14 14:50** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:18

Client ID: MW-6 **Lab ID: C416644-06RE1** **Sampled: 12/17/14 14:50** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:16	12/23/14 09:20
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 12:10

Client ID: MW-7 **Lab ID: C416644-07** **Sampled: 12/17/14 13:54** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:20

Client ID: MW-7 **Lab ID: C416644-07RE1** **Sampled: 12/17/14 13:54** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:23	12/23/14 09:37
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 12:13

Client ID: MW-8 **Lab ID: C416644-08** **Sampled: 12/17/14 14:21** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:26

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SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: MW-8 **Lab ID: C416644-08RE1** **Sampled: 12/17/14 14:21** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:23	12/23/14 09:54
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 12:15

Client ID: SW-1 **Lab ID: C416644-09** **Sampled: 12/17/14 15:20** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:23	12/22/14 23:22
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 10:21
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:29

Client ID: SW-2 **Lab ID: C416644-10** **Sampled: 12/17/14 13:25** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:23	12/22/14 23:39
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 10:24
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:31

Client ID: SW-3 **Lab ID: C416644-11** **Sampled: 12/17/14 14:10** **Received: 12/18/14 13:32**

Parameter	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 300.0	01/14/15	12/22/14 10:23	12/22/14 23:56
EPA 6010C	06/15/15	12/18/14 16:22	12/19/14 10:26
EPA 7470A	01/14/15	12/24/14 13:09	12/29/14 14:34

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

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SAMPLE DETECTION SUMMARY

Client ID: MW-1S **Lab ID: C416644-01RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	408	D	5.00	50.0	ug/L	EPA 6010C	R-05
Sulfate as SO4	310000	D	14000	25000	ug/L	EPA 300.0	

Client ID: MW-2S **Lab ID: C416644-02**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	200		1.00	10.0	ug/L	EPA 6010C	

Client ID: MW-3 **Lab ID: C416644-03**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Sulfate as SO4	760000	D	58000	100000	ug/L	EPA 300.0	

Client ID: MW-3 **Lab ID: C416644-03RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	151	D	5.00	50.0	ug/L	EPA 6010C	R-05

Client ID: MW-4 **Lab ID: C416644-04**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	70.9		1.00	10.0	ug/L	EPA 6010C	
Cadmium - Total	1.75		0.360	1.00	ug/L	EPA 6010C	
Mercury - Total	1.11		0.202	0.238	ug/L	EPA 7470A	
Sulfate as SO4	260000	D	14000	25000	ug/L	EPA 300.0	

Client ID: MW-5S **Lab ID: C416644-05**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	82.5		1.00	10.0	ug/L	EPA 6010C	
Sulfate as SO4	21000		2900	5000	ug/L	EPA 300.0	

Client ID: MW-6 **Lab ID: C416644-06RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	98.7	D	27.0	50.0	ug/L	EPA 6010C	
Barium - Total	155	D	5.00	50.0	ug/L	EPA 6010C	
Lead - Total	122	D	10.5	50.0	ug/L	EPA 6010C	
Sulfate as SO4	660000	D	29000	50000	ug/L	EPA 300.0	

Client ID: MW-7 **Lab ID: C416644-07RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	167	D	27.0	50.0	ug/L	EPA 6010C	
Barium - Total	205	D	5.00	50.0	ug/L	EPA 6010C	
Lead - Total	553	D	10.5	50.0	ug/L	EPA 6010C	
Sulfate as SO4	710000	D	29000	50000	ug/L	EPA 300.0	

Client ID: MW-8 **Lab ID: C416644-08RE1**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Arsenic - Total	124	D	27.0	50.0	ug/L	EPA 6010C	
Barium - Total	143	D	5.00	50.0	ug/L	EPA 6010C	
Lead - Total	263	D	10.5	50.0	ug/L	EPA 6010C	
Sulfate as SO4	620000	D	29000	50000	ug/L	EPA 300.0	

Client ID: SW-1 **Lab ID: C416644-09**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	27.3		1.00	10.0	ug/L	EPA 6010C	

Client ID: SW-2 **Lab ID: C416644-10**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	27.8		1.00	10.0	ug/L	EPA 6010C	
Sulfate as SO4	5500		2900	5000	ug/L	EPA 300.0	

Client ID: SW-3 **Lab ID: C416644-11**

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Barium - Total	80.0		1.00	10.0	ug/L	EPA 6010C	
Sulfate as SO4	9900		2900	5000	ug/L	EPA 300.0	

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ANALYTICAL RESULTS

Description: MW-1S | **Lab Sample ID:** C416644-01 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 12:53 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:06	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Barium [7440-39-3]^	**408**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 09:45	JDH	R-05
Cadmium [7440-43-9]^	5.00	UD	ug/L	5	5.00	4L18034	EPA 6010C	12/19/14 09:45	JDH	R-05
Chromium [7440-47-3]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 09:45	JDH	R-05
Lead [7439-92-1]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 09:45	JDH	R-05
Selenium [7782-49-2]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 09:45	JDH	R-05
Silver [7440-22-4]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 09:45	JDH	R-05

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**310000**	D	ug/L	5	25000	4L22009	EPA 300.0	12/23/14 09:03	AJB	

Description: MW-2S | **Lab Sample ID:** C416644-02 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 13:20 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:09	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:47	JDH	
Barium [7440-39-3]^	**200**		ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:47	JDH	
Cadmium [7440-43-9]^	1.00	U	ug/L	1	1.00	4L18034	EPA 6010C	12/19/14 09:47	JDH	
Chromium [7440-47-3]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:47	JDH	
Lead [7439-92-1]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:47	JDH	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:47	JDH	
Silver [7440-22-4]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:47	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	5000	U	ug/L	1	5000	4L22009	EPA 300.0	12/22/14 16:50	AJB	

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ANALYTICAL RESULTS

Description: MW-3 | **Lab Sample ID:** C416644-03 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 11:52 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:36	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05
Barium [7440-39-3]^	**151**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05
Cadmium [7440-43-9]^	5.00	UD	ug/L	5	5.00	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05
Chromium [7440-47-3]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05
Lead [7439-92-1]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05
Selenium [7782-49-2]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05
Silver [7440-22-4]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:08	JDH	R-05

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**760000**	D	ug/L	20	100000	4L22009	EPA 300.0	12/22/14 17:07	AJB	

Description: MW-4 | **Lab Sample ID:** C416644-04 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 12:20 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	**1.11**		ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:13	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:56	JDH	
Barium [7440-39-3]^	**70.9**		ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:56	JDH	
Cadmium [7440-43-9]^	**1.75**		ug/L	1	1.00	4L18034	EPA 6010C	12/19/14 09:56	JDH	
Chromium [7440-47-3]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:56	JDH	
Lead [7439-92-1]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:56	JDH	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:56	JDH	
Silver [7440-22-4]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 09:56	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**260000**	D	ug/L	5	25000	4L22009	EPA 300.0	12/22/14 17:58	AJB	

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ANALYTICAL RESULTS

Description: MW-5S | **Lab Sample ID:** C416644-05 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 11:27 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:15	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:10	JDH	
Barium [7440-39-3]^	**82.5**		ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:10	JDH	
Cadmium [7440-43-9]^	1.00	U	ug/L	1	1.00	4L18034	EPA 6010C	12/19/14 10:10	JDH	
Chromium [7440-47-3]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:10	JDH	
Lead [7439-92-1]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:10	JDH	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:10	JDH	
Silver [7440-22-4]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:10	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**21000**		ug/L	1	5000	4L22009	EPA 300.0	12/22/14 18:15	AJB	

Description: MW-6 | **Lab Sample ID:** C416644-06 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 14:50 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:18	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**98.7**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:10	JDH	
Barium [7440-39-3]^	**155**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:10	JDH	
Cadmium [7440-43-9]^	5.00	UD	ug/L	5	5.00	4L18034	EPA 6010C	12/19/14 12:10	JDH	
Chromium [7440-47-3]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:10	JDH	
Lead [7439-92-1]^	**122**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:10	JDH	
Selenium [7782-49-2]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:10	JDH	
Silver [7440-22-4]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:10	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**660000**	D	ug/L	10	50000	4L22009	EPA 300.0	12/23/14 09:20	AJB	

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ANALYTICAL RESULTS

Description: MW-7 | **Lab Sample ID:** C416644-07 | **Received:** 12/18/14 13:32
Matrix: Water | **Sampled:** 12/17/14 13:54 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:20	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**167**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:13	JDH	
Barium [7440-39-3]^	**205**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:13	JDH	
Cadmium [7440-43-9]^	5.00	UD	ug/L	5	5.00	4L18034	EPA 6010C	12/19/14 12:13	JDH	
Chromium [7440-47-3]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:13	JDH	
Lead [7439-92-1]^	**553**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:13	JDH	
Selenium [7782-49-2]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:13	JDH	
Silver [7440-22-4]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:13	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**710000**	D	ug/L	10	50000	4L22010	EPA 300.0	12/23/14 09:37	AJB	

Description: MW-8 | **Lab Sample ID:** C416644-08 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 14:21 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:26	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	**124**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:15	JDH	
Barium [7440-39-3]^	**143**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:15	JDH	
Cadmium [7440-43-9]^	5.00	UD	ug/L	5	5.00	4L18034	EPA 6010C	12/19/14 12:15	JDH	
Chromium [7440-47-3]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:15	JDH	
Lead [7439-92-1]^	**263**	D	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:15	JDH	
Selenium [7782-49-2]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:15	JDH	
Silver [7440-22-4]^	50.0	UD	ug/L	5	50.0	4L18034	EPA 6010C	12/19/14 12:15	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**620000**	D	ug/L	10	50000	4L22010	EPA 300.0	12/23/14 09:54	AJB	

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ANALYTICAL RESULTS

Description: SW-1 **Lab Sample ID:** C416644-09 **Received:** 12/18/14 13:32
Matrix: Ground Water **Sampled:** 12/17/14 15:20 **Work Order:** C416644
Project: Swift Creek **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:29	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:21	JDH	
Barium [7440-39-3]^	**27.3**		ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:21	JDH	
Cadmium [7440-43-9]^	1.00	U	ug/L	1	1.00	4L18034	EPA 6010C	12/19/14 10:21	JDH	
Chromium [7440-47-3]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:21	JDH	
Lead [7439-92-1]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:21	JDH	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:21	JDH	
Silver [7440-22-4]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:21	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	5000	U	ug/L	1	5000	4L22010	EPA 300.0	12/22/14 23:22	AJB	

Description: SW-2 **Lab Sample ID:** C416644-10 **Received:** 12/18/14 13:32
Matrix: Ground Water **Sampled:** 12/17/14 13:25 **Work Order:** C416644
Project: Swift Creek **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:31	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:24	JDH	
Barium [7440-39-3]^	**27.8**		ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:24	JDH	
Cadmium [7440-43-9]^	1.00	U	ug/L	1	1.00	4L18034	EPA 6010C	12/19/14 10:24	JDH	
Chromium [7440-47-3]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:24	JDH	
Lead [7439-92-1]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:24	JDH	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:24	JDH	
Silver [7440-22-4]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:24	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**5500**		ug/L	1	5000	4L22010	EPA 300.0	12/22/14 23:39	AJB	

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

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ANALYTICAL RESULTS

Description: SW-3 | **Lab Sample ID:** C416644-11 | **Received:** 12/18/14 13:32
Matrix: Ground Water | **Sampled:** 12/17/14 14:10 | **Work Order:** C416644
Project: Swift Creek | **Sampled By:** John Sherill

Metals by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Mercury [7439-97-6]^	0.238	U	ug/L	1	0.238	4L24029	EPA 7470A	12/29/14 14:34	T1D	

Metals (total recoverable) by EPA 6000/7000 Series Methods

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Arsenic [7440-38-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:26	JDH	
Barium [7440-39-3]^	**80.0**		ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:26	JDH	
Cadmium [7440-43-9]^	1.00	U	ug/L	1	1.00	4L18034	EPA 6010C	12/19/14 10:26	JDH	
Chromium [7440-47-3]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:26	JDH	
Lead [7439-92-1]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:26	JDH	
Selenium [7782-49-2]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:26	JDH	
Silver [7440-22-4]^	10.0	U	ug/L	1	10.0	4L18034	EPA 6010C	12/19/14 10:26	JDH	

Classical Chemistry Parameters

^ - ENCO Cary certified analyte [NC 591]

Analyte [CAS Number]	Results	Flag	Units	DF	PQL	Batch	Method	Analyzed	By	Notes
Sulfate as SO4 [14808-79-8]^	**9900**		ug/L	1	5000	4L22010	EPA 300.0	12/22/14 23:56	AJB	

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QUALITY CONTROL DATA

Metals by EPA 6000/7000 Series Methods - Quality Control

Batch 4L24029 - EPA 7470A

Blank (4L24029-BLK1) Prepared: 12/24/2014 13:09 Analyzed: 12/29/2014 13:36

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	0.200	U	0.200	ug/L							

LCS (4L24029-BS1) Prepared: 12/24/2014 13:09 Analyzed: 12/29/2014 13:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	4.63		0.200	ug/L	5.00		93	80-120			

Matrix Spike (4L24029-MS1) Prepared: 12/24/2014 13:09 Analyzed: 12/29/2014 13:42

Source: C414996-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	4.80		0.200	ug/L	5.00	0.200 U	96	75-125			

Matrix Spike Dup (4L24029-MSD1) Prepared: 12/24/2014 13:09 Analyzed: 12/29/2014 13:45

Source: C414996-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	4.86		0.200	ug/L	5.00	0.200 U	97	75-125	1	25	

Post Spike (4L24029-PS1) Prepared: 12/24/2014 13:09 Analyzed: 12/29/2014 13:47

Source: C414996-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Mercury	4.08		0.200	ug/L	5.00	-0.0640	82	75-125			

Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 4L18034 - EPA 3005A

Blank (4L18034-BLK1) Prepared: 12/18/2014 16:22 Analyzed: 12/19/2014 09:21

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	10.0	U	10.0	ug/L							
Barium	10.0	U	10.0	ug/L							
Cadmium	1.00	U	1.00	ug/L							
Chromium	10.0	U	10.0	ug/L							
Lead	10.0	U	10.0	ug/L							
Selenium	10.0	U	10.0	ug/L							
Silver	10.0	U	10.0	ug/L							

LCS (4L18034-BS1) Prepared: 12/18/2014 16:22 Analyzed: 12/19/2014 09:23

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	221		10.0	ug/L	200		110	80-120			
Barium	225		10.0	ug/L	200		113	80-120			
Cadmium	22.8		1.00	ug/L	20.0		114	80-120			
Chromium	216		10.0	ug/L	200		108	80-120			
Lead	223		10.0	ug/L	200		112	80-120			
Selenium	224		10.0	ug/L	200		112	80-120			
Silver	213		10.0	ug/L	200		107	80-120			

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

QUALITY CONTROL DATA

Metals (total recoverable) by EPA 6000/7000 Series Methods - Quality Control

Batch 4L18034 - EPA 3005A - Continued

Matrix Spike (4L18034-MS1) Prepared: 12/18/2014 16:22 Analyzed: 12/19/2014 09:29

Source: C416644-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	213		10.0	ug/L	200	29.3	92	75-125			
Barium	517		10.0	ug/L	200	330	94	75-125			
Cadmium	16.9		1.00	ug/L	20.0	1.00 U	84	75-125			
Chromium	175		10.0	ug/L	200	10.0 U	88	75-125			
Lead	174		10.0	ug/L	200	10.0 U	87	75-125			
Selenium	250		10.0	ug/L	200	54.7	98	75-125			
Silver	200		10.0	ug/L	200	10.0 U	100	75-125			

Matrix Spike Dup (4L18034-MSD1) Prepared: 12/18/2014 16:22 Analyzed: 12/19/2014 09:32

Source: C416644-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	220		10.0	ug/L	200	29.3	95	75-125	3	20	
Barium	517		10.0	ug/L	200	330	94	75-125	0.05	20	
Cadmium	16.8		1.00	ug/L	20.0	1.00 U	84	75-125	0.4	20	
Chromium	174		10.0	ug/L	200	10.0 U	87	75-125	0.5	20	
Lead	176		10.0	ug/L	200	10.0 U	88	75-125	1	20	
Selenium	254		10.0	ug/L	200	54.7	100	75-125	2	20	
Silver	198		10.0	ug/L	200	10.0 U	99	75-125	1	20	

Post Spike (4L18034-PS1) Prepared: 12/18/2014 16:22 Analyzed: 12/19/2014 09:42

Source: C416644-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Arsenic	0.206		0.0100	mg/L	0.200	0.0293	88	80-120			
Barium	0.506		0.0100	mg/L	0.200	0.330	88	80-120			
Cadmium	0.0159		0.00100	mg/L	0.0200	-0.000353	79	80-120			QM-08
Chromium	0.160		0.0100	mg/L	0.200	0.000444	80	80-120			
Lead	0.162		0.0100	mg/L	0.200	-0.00205	81	80-120			
Selenium	0.239		0.0100	mg/L	0.200	0.0547	92	80-120			
Silver	0.180		0.0100	mg/L	0.200	-0.00161	90	80-120			

Classical Chemistry Parameters - Quality Control

Batch 4L22009 - NO PREP

Blank (4L22009-BLK1) Prepared: 12/22/2014 10:16 Analyzed: 12/22/2014 10:47

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	5000	U	5000	ug/L							

LCS (4L22009-BS1) Prepared: 12/22/2014 10:16 Analyzed: 12/22/2014 11:22

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	47000		5000	ug/L	50000		94	90-110			

Matrix Spike (4L22009-MS1) Prepared: 12/22/2014 10:16 Analyzed: 12/22/2014 18:49

Source: C414993-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	26000		5000	ug/L	20000	7800	89	90-110			QM-05

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

QUALITY CONTROL DATA

Classical Chemistry Parameters - Quality Control

Batch 4L22009 - NO PREP - Continued

Matrix Spike Dup (4L22009-MSD1) Prepared: 12/22/2014 10:16 Analyzed: 12/22/2014 19:06

Source: C414993-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	26000		5000	ug/L	20000	7800	90	90-110	0.3	10	

Batch 4L22010 - NO PREP

Blank (4L22010-BLK1) Prepared: 12/22/2014 10:23 Analyzed: 12/22/2014 17:41

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	5000	U	5000	ug/L							

LCS (4L22010-BS1) Prepared: 12/22/2014 10:23 Analyzed: 12/22/2014 11:39

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	47000		5000	ug/L	50000		94	90-110			

Matrix Spike (4L22010-MS1) Prepared: 12/22/2014 10:23 Analyzed: 12/23/2014 00:47

Source: C414996-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	20000		5000	ug/L	20000	3400	84	90-110			QM-05

Matrix Spike Dup (4L22010-MSD1) Prepared: 12/22/2014 10:23 Analyzed: 12/23/2014 01:04

Source: C414996-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Sulfate as SO4	21000		5000	ug/L	20000	3400	87	90-110	3	10	QM-05

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FLAGS/NOTES AND DEFINITIONS

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
MRL	Method Reporting Limit. The MRL is roughly equivalent to the practical quantitation limit (PQL) and is based on the low point of the calibration curve, when applicable, sample preparation factor, dilution factor, and, in the case of soil samples, moisture content.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a "tentative identification".
P	Greater than 25% concentration difference was observed between the primary and secondary GC column. The lower concentration is reported.
QM-05	The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
QM-08	Post-digestion spike did not meet method requirements due to confirmed matrix effects (dilution test).
R-05	The sample was diluted due to the presence of high levels of non-target analytes resulting in elevated reporting limits.

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ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

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Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Ct.
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

www.encolabs.com

Client Name: Sherrill Environmental, Inc. (SH004)	Project Number: [none]
Address: 3326 Rugby Road	Project Name/Desc: Swift Creek
City/ST/Zip: Durham, NC 27707	PO # / Billing Info:
Tel: (919) 493-6555 Fax: (919) 493-6554	Reporting Contact: Jack Sherrill
Sampler(s) Name, Affiliation (Print): John Sherrill-Sherrill Environmental	Billing Contact: Accounts Payable
Sampler(s) Signature: John Sherrill	Site Location / Time Zone:

Requested Turnaround Times

Note : Rush requests subject to acceptance by the facility

✓ Standard

___ Expedited

Due __/__/__

Lab Workorder: C416644

Requested Analyses / Preservation (See Codes) (Combine as necessary)

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Ag,As,Ba,Cd,Cr,Pb,Se	Hg	Sulfate 300								Sample Comments
	MW-1S	12/17/14	1253		GW	2	X	X	X								
	MW-2S		1320	SS	GW	2	X	X	X								
	MW-3		~~1152~~	1220	GW	2	X	X	X								
	MW-4		~~1220~~	1152	GW	2	X	X	X								
	MW-5S		1127		GW	2	X	X	X								
	MW-6		1450		GW	2	X	X	X								
	MW-7		1354		GW	2	X	X	X								
	MW-8		1422		GW	2	X	X	X								
	SW-1		1520		GW	2	X	X	X								
	SW-2		1325		GW	2	X	X	X								
	SW-3		1410		GW	2	X	X	X								

<-- Total # of Containers

Sample Kit Prepared By: SPF	Date/Time: 12/16/14	Relinquished By: John Sherrill	Date/Time: 12/18/14	Received By: [signature]	Date/Time: 12/18/14 1332
Comments/Special Reporting Requirements		Relinquished By	Date/Time	Received By	Date/Time
		Relinquished By	Date/Time	Received By	Date/Time
		Cooler #'s & Temps on Receipt: 2.1		Condition Upon Receipt: ✓ Acceptable ___ Unacceptable	

Matrix : GW-Groundwater SO-Soil DW-Drinking Water SE-Sediment SW-Surface Water WW-Wastewater A-Air O-Other (detail in comments) **Preservation:** I-Ice H-HCl N-HNO3 S-H2SO4 NO-NaOH O-Other (detail in comments)

Note : All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Date: 12/17/2014
Permit No.: _____
Time: 1228
Client : ReUse/Full Circle
Weather: 50° clear
WELL NUMBER: MW-1S
Personnel: J. Sherrill, LG
Well I.Diam: _____
Measurements from TOC
Screened interval: _____
Total well depth (TD): 15.7
Depth to water (DTW): 7.88
Length of water column: 7.82
Volume in well (gal): 1.25
Total water volume purged: 3.5
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1232 0.2	1235	5.56	16.06	12.417	2.1	109	133
1.2	1240	5.56	16.17	14.530	1.9	66	28.7
2.5	1245	5.51	1634	15.890	3.8	60	10.2
3.5	1250	5.46	16.45	16.908	1.8	61	3.5

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

MW-1D
▼ 8.30

Sample Collection Time: 1253

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Date: 12/17/2014
Permit No.: _____
Time: 1300
Client : ReUse/Full Circle
Weather: 50°clear
WELL NUMBER: MW-2S
Personnel: J. Sherrill, LG
Well I.Diam: _____
Measurements from TOC
Screened interval: _____
Total well depth (TD): 18.7
Depth to water (DTW): 4.22
Length of water column: 14.48
Volume in well (gal): 2.3
Total water volume purged: 3.5
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1302 0.4	1305	7.02	14.75	0.732	1.2	-79	11.5
2.0	1310	7.09	15.15	0.700	0.8	-66	6.3
3.0	1315	7.06	15.29	0.710	0.7	-85	2.8
3.5	1318	7.04	15.17	0.716	1.0	-83	2.2

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

MW-2D
4.53

Sample Collection Time: 1320

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Date: 12/17/2014
Permit No.:
Time: 1156
Client : ReUse/Full Circle
Weather: 50°Clear
WELL NUMBER: MW-3
Personnel: J. Sherrill, LG
Well I.Diam:
Measurements from TOC
Screened interval:
Total well depth (TD): 20.0
Depth to water (DTW): 9.01
Length of water column: 10.99
Volume in well (gal): 1.75
Total water volume purged: 3.2
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1200 0.2	1203	6.09	16.33	6.616	3.1	30.7	20.7
0.8	1205	6.10	16.26	6.646	2.6	18.2	6.9
1.8	1210	6.06	15.91	6.591	4.6	11.3	8.8
2.5	1213	6.03	15.89	6.750	6.2	7.7	7.2
2.8	1215	6.02	15.82	6.963	21.0	4.4	6.4
3.2	1218	5.99	15.91	7.118	6.9	2.6	5.8

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

Sample Collection Time: 1220

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Date: 12/17/2014
Permit No.: _____
Time: 1130
Client : ReUse/Full Circle
Weather: 50°clear
WELL NUMBER: MW-4
Personnel: J. Sherrill, LG
Well I.Diam: _____
Measurements from TOC
Screened interval: _____
Total well depth (TD): 20.0
Depth to water (DTW): 13.71
Length of water column: 6.29
Volume in well (gal): 1.0
Total water volume purged: 2.7
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1134 0.4	1137	4.82	18.03	1.758	9.2	180	5.8
1.0	1140	5.00	18.18	1.880	7.2	154	1.9
1.5	1143	5.15	18.15	1.969	21.4	127	0.8
2.0	1145	5.16	18.22	1.992	6.8	124	0.6
2.7	1150	5.28	18.18	2.054	5.0	115	2.0

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

Sample Collection Time: 1152

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Permit No.: _____
Client : ReUse/Full Circle
WELL NUMBER: MW-5S
Well I.Diam: _____
Measurements from TOC
Screened interval: _____
Total well depth (TD): 17.0
Length of water column: 9.06
Total water volume purged: 2.5
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Date: 12/17/2014
Time: 1055
Weather: 50° clear
Personnel: J. Sherrill, LG

Depth to water (DTW): 7.94
Volume in well (gal): 1.4

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
0.1	1115	4.25	15.57	0.219	22.3	160	4.4
1.0	1118	4.11	15.44	0.194	21.8	164	3.2
1.2	1120	4.18	15.49	0.189	22.0	158	3.6
2.0	1122	4.29	15.58	0.184	22.0	149	4.2
2.5	1125	4.37	15.64	0.181	21.8	142	4.5

1113

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

MW-5D
▼7.46

Sample Collection Time: 1127

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Permit No.: _____
Client : ReUse/Full Circle
WELL NUMBER: MW-6
Well I.Diam: _____
Measurements from TOC
Screened interval: _____
Total well depth (TD): 19.4
Length of water column: 12.16
Total water volume purged: 3.0
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Date: 12/17/2014
Time: 1432
Weather: 50° clear
Personnel: J. Sherrill, LG

Depth to water (DTW): 7.24
Volume in well (gal): 1.9

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1434 1.2	1440	3.67	15.98	13.141	1.6	223	0.6
2.0	1442	3.68	16.13	13.130	1.3	218	1.2
2.5	1445	3.68	16.27	13.127	1.2	215	2.2
3.0	1447	3.69	16.25	13.124	1.1	212	2.3

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

Lane Swamp Bridge
▼ 2.10

Sample Collection Time: 1450

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Date: 12/17/2014
Permit No.:
Time: 1332
Client : ReUse/Full Circle
Weather: 50°Clear
WELL NUMBER: MW-7
Personnel: J. Sherrill, LG
Well I.Diam:
Measurements from TOC
Screened interval:
Total well depth (TD): 19.5
Depth to water (DTW): 7.40
Length of water column: 12.1
Volume in well (gal): 1.9
Total water volume purged: 3.0
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1336 0.4	1340	3.65	16.92	19.683	2.2	233	2.4
1.5	1345	3.70	17.01	20.409	2.2	226	0.9
2.4	1348	3.71	17.00	20.559	4.3	224	1.0
3.0	1350	3.71	16.99	20.669	1.8	221	1.0

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

Sample Collection Time: 1354

Sherrill Environmental, Inc.

GROUNDWATER SAMPLING FIELD DATA WORK SHEET

Project Name: Swift Creek
Permit No.: _____
Client : ReUse/Full Circle
WELL NUMBER: MW-8
Well I.Diam: _____
Measurements from TOC
Screened interval: _____
Total well depth (TD): 19.0
Length of water column: 14.66
Total water volume purged: 3.2
Method Purged: Peristaultic Pump
Method sampled: Peristaultic Pump

Date: 12/17/2014
Time: 1400
Weather: 50°clear
Personnel: J. Sherrill, LG

Depth to water (DTW): 4.34
Volume in well (gal): 2.3

Purge Vol. (G)	Time	pH	Temp (C)	Specific Cond. (mS/cm)	Dissolved Oxygen (%)	ORP (mV)	Turbidity (NTU)
1.2	1410	3.74	15.40	15.044	1.7	270	0.9
2.5	1415	3.76	15.42	15.427	1.2	252	0.4
3.0	1418	3.77	15.43	15.491	1.1	247	0.2
3.2	1420	3.78	15.29	15.614	1.5	243	0.3

1404

Remarks on Sampling and Well Condition:
Sample Collected:
Sulfate and Total RCRA Metals

Sample Collection Time: 1422