ROGERS & CALLCOTT
ENGINEERS, INC.
P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 • FAX (864) 233-9058

AN EMPLOYEE-OWNED COMPANY

December 13, 2012

John Abernathy
Solid Waste Groundwater Section
SC DHEC
2600 Bull Street
Columbia, SC 29201

Subject: 2012 Annual Report of Groundwater Conditions
Twelvemile Creek Sediment Management Unit - Pickens County, SC
Rogers & Callcott Project # 10-012

Dear Mr. Abernathy:

On behalf of Schlumberger Technology Corp., Rogers and Callcott has prepared this Annual Report of Groundwater Conditions for the Twelvemile Creek Sediment Management Unit (SMU) located at the Sangamo Weston Lake Hartwell Site in Pickens County, SC.

If you have questions or comments regarding the 2012 Annual Report, please contact me at 864-232-1556.

Sincerely,

ROGERS & CALLCOTT ENGINEERS, INC.

Patrick Sanderson
Project Manager

George Y. Maalouf, P.G.
Principal (SC Reg. #1027)

GEORGE Y. MAALOUF
REGISTERED
No. 1027
SOUTH CAROLINA
PROFESSIONAL GEOLOGIST

Attachments

Copy: Craig Zeller – EPA
Virgilio Cocianni – Schlumberger (electronic)
Lance Ketcham – Arcadis (electronic copy)

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U.S. EPA REGION IV

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ACRONYMS

ft	feet
ft/yr	feet per year
MCL	maximum contaminant level
mg/L	milligrams per Liter
mL/min	milliliters per minute
PCB	polychlorinated biphenyls
SCDHEC	South Carolina Department of Health and Environmental Control
Schlumberger	Schlumberger Technology Corporation
SMU	Sediment Management Unit

INTRODUCTION

On behalf of Schlumberger Technology Corp. (Schlumberger), Rogers and Callcott has prepared this Annual Report of Groundwater Conditions for the Twelvemile Creek Sediment Management Unit (SMU) located at the Sangamo Weston Lake Hartwell Polychlorinated Biphenyl (PCB) Contamination Superfund Site in Pickens County (the Site). As shown on **Figure 1**, the Site is located approximately 2.5 miles northwest of the town of Norris, SC.

During the 2012 reporting period, groundwater samples were collected from each of the five monitoring wells located at the SMU in March, June, and September 2012. Data submittals to the South Carolina Department of Health and Environmental Control (SCDHEC) in May 2012 and September 2012 provided results of the samples collected in March and June, respectively. This report summarizes the sampling results and hydrogeologic conditions observed at the Site during the September 2012 event. Additionally, this report provides recommendations for modifying the sampling program during future sampling rounds.

BACKGROUND

In preparation for removal of two dams on Twelvemile Creek, Schlumberger constructed the SMU to contain dredged sediment that had accumulated behind each of the dams. The unit was developed in accordance with the requirements set forth in the SCDHEC landfill regulations for a Class Three landfill. Approval to operate the SMU was provided in a March 11, 2010 letter from SCDHEC (Taylor to Ferguson).

A Closure and Post-Closure Care Plan prepared by Arcadis in January 2010 describes the post-closure care activities that must be carried out during the post-closure care period at the SMU. The groundwater monitoring component of the Post-Closure Care Plan is described in greater detail in the *Groundwater Monitoring Plan* prepared by Arcadis in March 2010 and approved by SCDHEC on March 11, 2010. As proposed in the monitoring plan, five monitoring wells were installed along the edges of the SMU in May 2010 to meet the requirements of R.61-107.19, Part V, subpart E.258.53.d. Monitoring well locations are shown on **Figure 2**. MW-1 was installed as the upgradient background well, located north of the SMU. Wells MW-2, MW-3, MW-4, and MW-5 are located along the downgradient edge of the SMU providing compliance points. Well construction information for all wells was documented in a June 17, 2010 report and is summarized in **Table 1**.

The Site *Groundwater Monitoring Plan* also required quarterly sampling of all monitoring wells during the first year of monitoring, based on presumed closure after six months of operation to be followed by semi-annual post-closure sampling. Three semi-annual sampling events were conducted during SMU operation in June 2010, December 2010, and June 2011 to meet the requirements of R.61-107.19, Part V, subpart E.258.54.b. Landfilling operations were completed, and the landfill cap was installed by early November 2011. **Figure 2** provides an aerial photograph and topographical contours of the SMU following cap completion.

The December 2011 sampling event and the three subsequent sampling rounds conducted in the 2012 reporting period comprise the four quarterly monitoring events to be conducted during the first year following SMU closure. Approval of SMU notation to deed and start of post-closure care period was provided by SCDHEC in a letter dated November 30, 2012.

SITE HYDROGEOLOGY

Prior to sampling, depths to water were recorded at each monitoring well on September 19, 2012. Water depths measured at each well in reference to the top of casing, the top of the well screen, and the top of rock, in addition to groundwater elevations are provided in **Table 2**. **Figure 2** depicts the potentiometric groundwater surface inferred from the September 2012 water levels and local topography. As the Site is located atop a north-south trending ridge with steep slopes to the east, west, and south, a groundwater divide is inferred coinciding with the top of the ridge. As such, the estimated groundwater flow direction is partially radial, with components to the west toward Camp Creek and to the south and southeast toward Twelvemile Creek. The current monitoring network appears to be sufficient for the purpose of detecting a potential release from the SMU based on the location of monitoring wells MW-2 to the east, MW-3 to the southeast, MW-4 to the south, and MW-5 to the southwest.

Water levels dropped in monitoring wells MW-1, MW-2, MW-3, and MW-5 between June 2012 and September 2012, ranging between 0.06 ft measured at MW-1 and 0.34 ft at MW-5. The water level rose 0.15 ft in MW-4 during the same period. In general, the monitoring wells have exhibited considerable decreases in static water levels since monitoring began in June 2010 with the exception of MW-2, which has fluctuated seasonally. At the remaining wells, water levels have decreased from 2.69–4.53 ft since June 2010. Similar to previous sampling events, the water table occurred in bedrock at MW-1, MW-2, and MW-3 and in saprolite at MW-4 and MW-5 in September 2012.

Using the water levels measured in September 2012, hydraulic conductivity values obtained from slug tests conducted on each monitoring well in May 2010 (**Table 1**), and an assumed effective porosity of 25%, groundwater seepage velocities (V) were calculated for the Site using the following formula:

$$V = [KI]/n_e$$

where: K is the hydraulic conductivity
I is the horizontal hydraulic gradient
n_e is the effective porosity

Due to the radial flow direction at the Site, hydraulic gradients were calculated from the center of the cell toward each of the four downgradient wells using the potentiometric contours inferred in September 2012 (**Figure 2**). The calculated gradients and resultant groundwater velocities for each direction are included in **Table 2**. The calculated groundwater velocities for each direction were approximately 16 feet per year (ft/yr) in shallow bedrock to the east, 7 ft/yr in shallow bedrock to

the southeast, 247 ft/yr (deep saprolite/shallow bedrock) to the south, and 12 ft/yr in saprolite to the southwest. The wide range in calculated velocities in the wells screened at least partially in bedrock (7–247 ft/yr) is thought to be due to the nature of fractured rock.

MONITORING WELL SAMPLING AND ANALYSIS

Purging and sampling of monitoring wells was conducted following the procedures and protocols detailed in the approved *Groundwater Monitoring Plan*. A bladder pump was used to provide low flow/low stress purging and sampling at a flow rate of no more than 100 milliliters per minute (mL/min). Groundwater samples were analyzed at the Rogers and Callcott laboratory in Greenville, SC (SC Identification # 23105) for the 15 metals and 7 PCBs listed in Appendix A of the *Groundwater Monitoring Plan*. Two groundwater seeps to the west of the Site along Camp Creek identified during previous monitoring events remained at very low flow conditions in September and once again could not be sampled. Approximate seep locations are shown on **Figure 2**. Laboratory analytical reports are provided in **Appendix A**. The Quality Control Summary and Data Verification, including the case narrative, are provided in **Appendix B**.

RESULTS AND DISCUSSION

The September 2012 analytical results are summarized in **Table 3**. The groundwater quality database for the SMU is included as **Appendix C** to provide current and previous sample results. In September 2012 PCBs were not detected in any of the monitoring wells. Metals including barium and nickel were detected at background well MW-1 and in MW-5, while cobalt, copper, and zinc were detected at MW-5 only. Although MW-5 routinely contains barium, cobalt, nickel, and zinc at concentrations greater than those in MW-1, each of these constituents has exhibited a decreasing concentration trend since the initial sampling event in June 2010 (**Figures 3-6**). Based on PCB concentrations below detection limits and metals below June 2010 baseline concentrations at all downgradient monitoring wells, there is no evidence that groundwater has been impacted by landfilling operations conducted at the SMU. Additionally, all metals detected during the September 2012 monitoring event were either below the Maximum Contaminant Level (MCL) or do not have a current MCL established.

Statistical analyses for detected constituents are recommended after a minimum of four sampling events have been conducted at the SMU. The September 2012 event marked the seventh sampling event for the Site. Statistical analyses for MW-2, MW-3, and MW-4 are not necessary as concentrations of all metals have been consistently at or below the background and baseline levels at all three wells. Although MW-5 routinely exhibits barium, cobalt, nickel, and zinc concentrations above background levels measured at MW-1, these metals were detected in MW-5 at higher concentrations during the initial sampling event in June 2010, which was prior to the beginning of SMU operation indicating that these concentrations are representative of background conditions. This variation in the natural range of metal concentrations at MW-5 in comparison with the other wells is likely due to the fact that MW-5 is screened entirely within the saprolite while the remaining monitoring wells are screened primarily in bedrock.

RECOMMENDATIONS FOR 2013

Based on a review of the historical groundwater monitoring conducted at the SMU, the following modifications to the sampling program are recommended for future events:

- **Reduce the analyte list to exclude metals analyses.** As stated in R.61-107.19 Part V, subpart E.258.54.a.1., any of the Appendix IV parameters may be deleted from the analytical parameters if the constituents are not reasonably expected to be contained in or derived from waste contained within the landfill. Since the sediments placed in the SMU during dredging operations are not reasonably expected to contain metals, continued monitoring for metals is not warranted, and we propose to remove these constituents from further analysis. A sufficient number of background measurements have been collected for metals at all Site monitoring wells if metals analyses are deemed necessary in the future.

- **Eliminate monitoring of groundwater seeps.** Two small groundwater seeps have been identified along the banks during each sampling event at the locations approximated on **Figure 2**; however, both seeps have consistently been at very low flow conditions, which have precluded sample collection throughout the monitoring period. The seeps are located approximately 400 ft downgradient of sentinel well MW-5, and therefore any groundwater impacts will be detected at MW-5 several years before they are evident at the seeps. As such, it is recommended that monitoring of these groundwater seeps is discontinued at this time.

In accordance with the March 2010 *Groundwater Monitoring Plan* and R.61-107.19 Part V, subpart E.258.54.b., groundwater monitoring will be conducted on a semiannual basis going forward. Therefore, the spring sampling event is currently scheduled for March 2013 followed by the fall sampling event in September 2013. A *Semiannual Groundwater Monitoring Report* will be submitted on or before June 15, 2013. The 2013 *Annual Groundwater Monitoring Report* will be submitted on or before December 15, 2013.

TABLES

TABLE 1
WELL CONSTRUCTION DETAILS
Twelvemile Creek SMU - Pickens County
Schlumberger Technology Corporation

Well No.	Top of Casing Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Total Depth (ft bgs)	Depth to Bedrock (ft bgs)	Bedrock Elevation (ft bgs)	Monitored Interval[1] (ft bgs)	Hydraulic Conductivity[2] (ft/yr)	Monitored Aquifer
MW-1	931.35	928.84	70.0	60.0	868.8	53.5 - 68.5	125	Deep Saprolite/Shallow Bedrock
MW-2	893.71	891.26	65.0	51.0	840.3	53.5 - 63.5	54	Shallow Bedrock
MW-3	893.10	890.96	90.4	52.5	838.5	58.0 - 90.4	20	Shallow Bedrock
MW-4	904.30	902.07	91.5	80.0	822.1	75.0 - 90.0	789	Deep Saprolite/Shallow Bedrock
MW-5	906.94	904.52	68.0	68.0	836.5	53.0 - 68.0	90	Deep Saprolite

[1]All monitored intervals consist of 0.01-inch slot, 2-inch diameter PVC well screens except for MW-3, which is a 4-inch open bedrock boring.

[2] Hydraulic conductivity values from rising head slug tests conducted in May 2010

ft amsl - feet above mean sea level

ft bgs - feet below ground surface

TABLE 2
GROUNDWATER ELEVATIONS AND HYDRAULIC GRADIENTS - SEPTEMBER 2012
Twelvemile Creek SMU - Pickens County, SC
Schlumberger Technology Corporation

Well No.	Top of Casing (ft amsl)	Bedrock Elevation (ft amsl)	Depth to Water (ft BTOC)	GW Elevation (ft amsl)	Water Level Above(+) or Below(-) Top of Screen (ft)	Water Level Above (+) or Below (-) Top of Rock (ft)
MW-1	931.35	868.8	66.26	865.09	-10.3	-3.8
MW-2	893.71	840.3	56.47	837.24	-0.5	-3.0
MW-3	893.10	838.5	71.33	821.77	-11.2	-16.7
MW-4	904.30	822.1	80.86	823.44	-3.6	1.4
MW-5	906.94	836.5	64.15	842.79	-8.7	6.3

ft amsl - feet above mean sea level
ft BTOC - feet below top of casing

Water Level Gradient Calculations

Well No.	Flow Direction	Rise	Run	Gradient
MW-2	East	12.76	170	0.08
MW-3	Southeast	18.23	215	0.08
MW-4	South	26.56	340	0.08
MW-5	Southwest	7.21	210	0.03

Groundwater Velocity Calculations

Well No.	Flow Direction	K (ft/yr)[1]	Effective Porosity[2]	Seepage Velocity (ft/yr)
MW-2	East	54	0.25	16
MW-3	Southeast	20	0.25	7
MW-4	South	789	0.25	247
MW-5	Southwest	90	0.25	12

[1]Hydraulic conductivity values (K) measured at wells MW-2, MW-3, MW-4, and MW-5 used for calculation of east-, southeast-, southwest-, and west-flowing groundwater velocities, respectively.
[2] Effective porosity of 0.25 assumed throughout Site.

TABLE 3
SUMMARY OF ANALYTICAL RESULTS
SEPTEMBER 2012

Twelvemile Creek SMU - Pickens County
Schlumberger Technology Corporation

Analyte	MW-1*	MW-2	MW-3	MW-4	MW-5	MCL
Antimony	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.006
Arsenic	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.010
Barium	**0.041**	< 0.010	< 0.010	< 0.010	**0.045**	2.0
Beryllium	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.004
Cadmium	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	0.005
Chromium	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1
Cobalt	< 0.010	< 0.010	< 0.010	< 0.010	**0.036**	NE
Copper	< 0.004	< 0.004	< 0.004	< 0.004	**0.004**	1.3 [1]/1.0[2]
Lead	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.015 [1]
Nickel	**0.046**	< 0.020	< 0.020	< 0.020	**0.074**	NE
Selenium	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.05
Silver	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.1 [2]
Thallium	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.002
Vanadium	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	NE
Zinc	< 0.010	< 0.010	< 0.010	< 0.010	**0.044**	5 [2]
PCBs[3]	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005

- Results are in milligrams per Liter (mg/L)
*Background Well
Bold entries represent detections.
MCL - Maximum Contaminant Level
[1]Action level for drinking water system requiring corrosion control
[2]Secondary MCL
[3]Comprised of polychlorinated biphenyls 1016, 1221, 1232, 1242, 1248, 1254, 1260
NE = Not Established

FIGURES

N
W E
S

0 1000 2000 4000
Feet

REFERENCE:
USGS SIX MILE 7.5 MIN. QUAD., 1961, PHOTOREVISED 1980

ROGERS & CALLCOTT
ENGINEERS, INC.

DRAWN BY: MAL 3/9/2012
CHECKED BY: PMS
APPROVED BY: GYM

Friday, March 09, 2012, 03:43:55 PM
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FIGURE 1
SITE LOCATION MAP

TWELVEMILE CREEK SMU
PICKENS COUNTY, SOUTH CAROLINA

ROGERS & CALLCOTT ENGINEERS, INC.

FIGURE 2
SEPTEMBER 19, 2012 GROUNDWATER POTENTIOMETRIC MAP

TWELVEMILE CREEK SMU
PICKENS COUNTY, SOUTH CAROLINA
SCHLUMBERGER TECHNOLOGY CORP.

MONITORING WELL
MW-2
837.24 GROUNDWATER ELEVATION (FT MSL) (MEASURED 9/19/12)

GROUNDWATER FLOW DIRECTION

850 GROUNDWATER POTENTIOMETRIC LINE (DASHED WHERE INFERRED)

TOPOGRAPHIC CONTOUR

PROPERTY LINE

STREAM FLOW DIRECTION

REFERENCE:
Base map provided by Site Design, Inc. (monitoring well locations.dwg, 5/21/10, and drawing S07642.01-MONWELL.DWG, 5/5/10). Map has not been field checked.
Topography and 2011 aerial photo provided by CH2M Hill (AS-BUILT-CAP.dwg, 10/24/11, and SMU-Dec2011.jpg, 12/8/11).

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0 75 150 300 Feet

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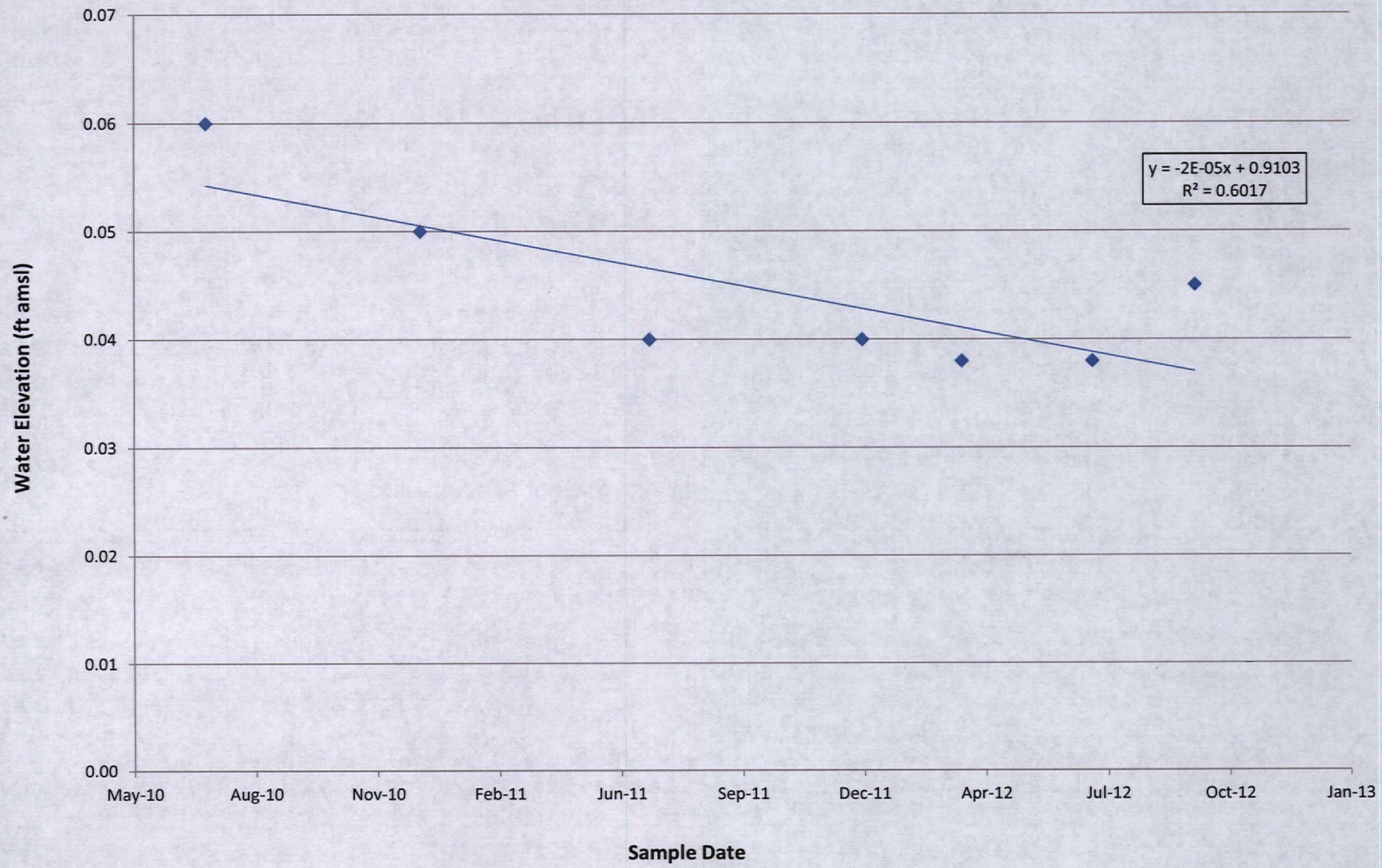
FIGURE 3

BARIUM CONCENTRATIONS AT MW-5

Twelvemile Creek SMU - Pickens County

Schlumberger Technology Corporation



COBALT CONCENTRATIONS AT MW-5

Twelvemile Creek SMU - Pickens County

Schlumberger Technology Corporation

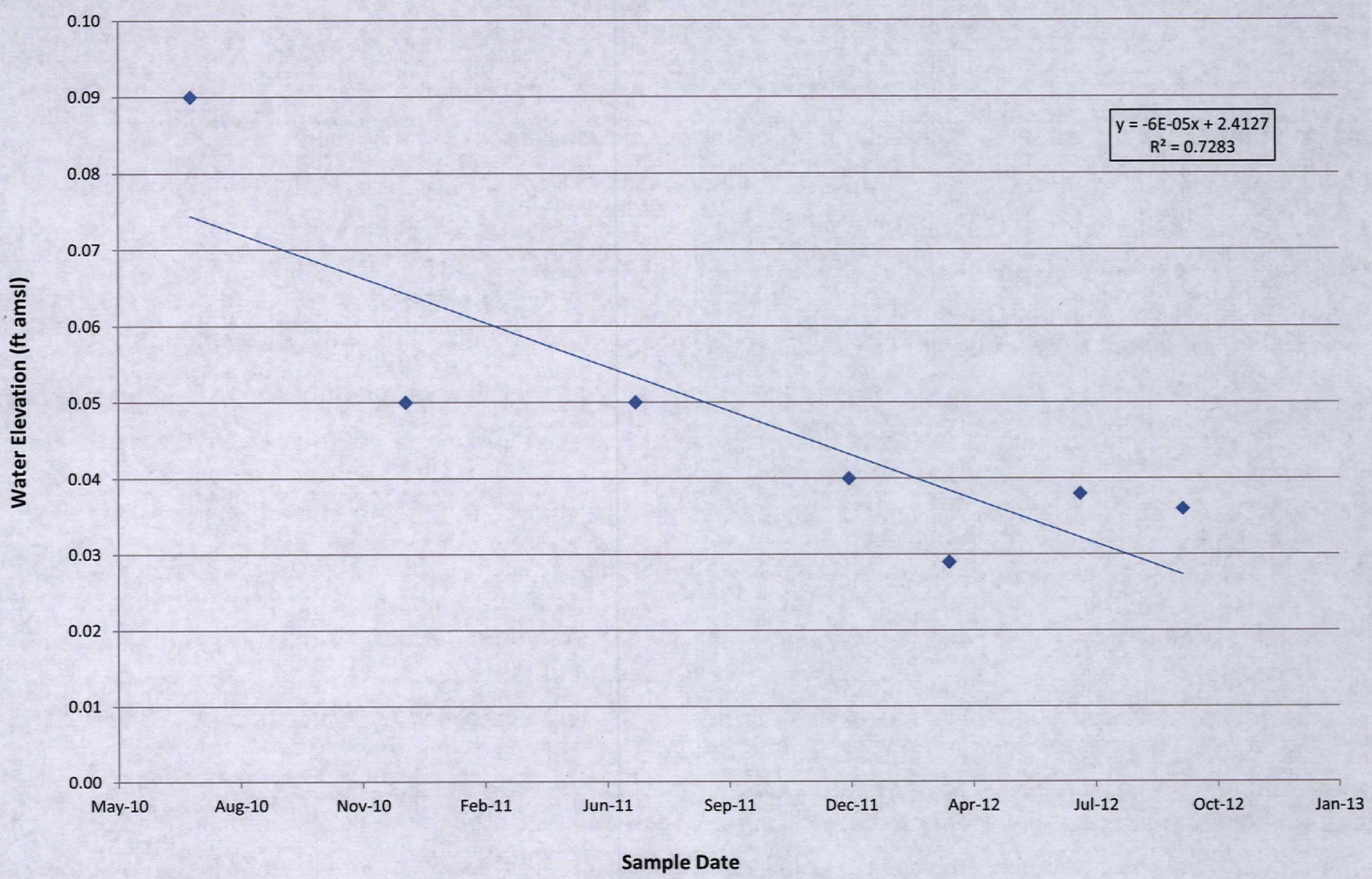
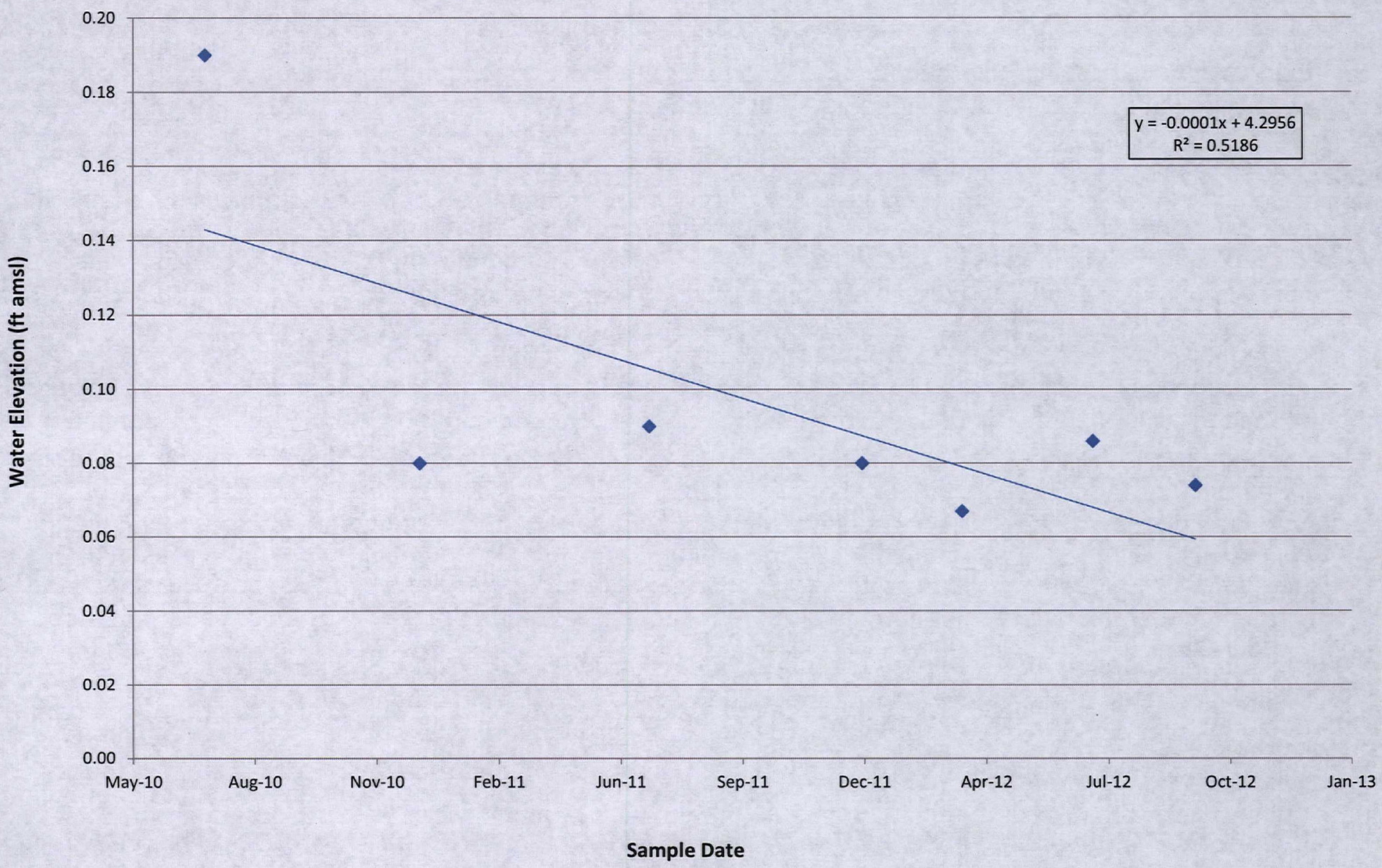


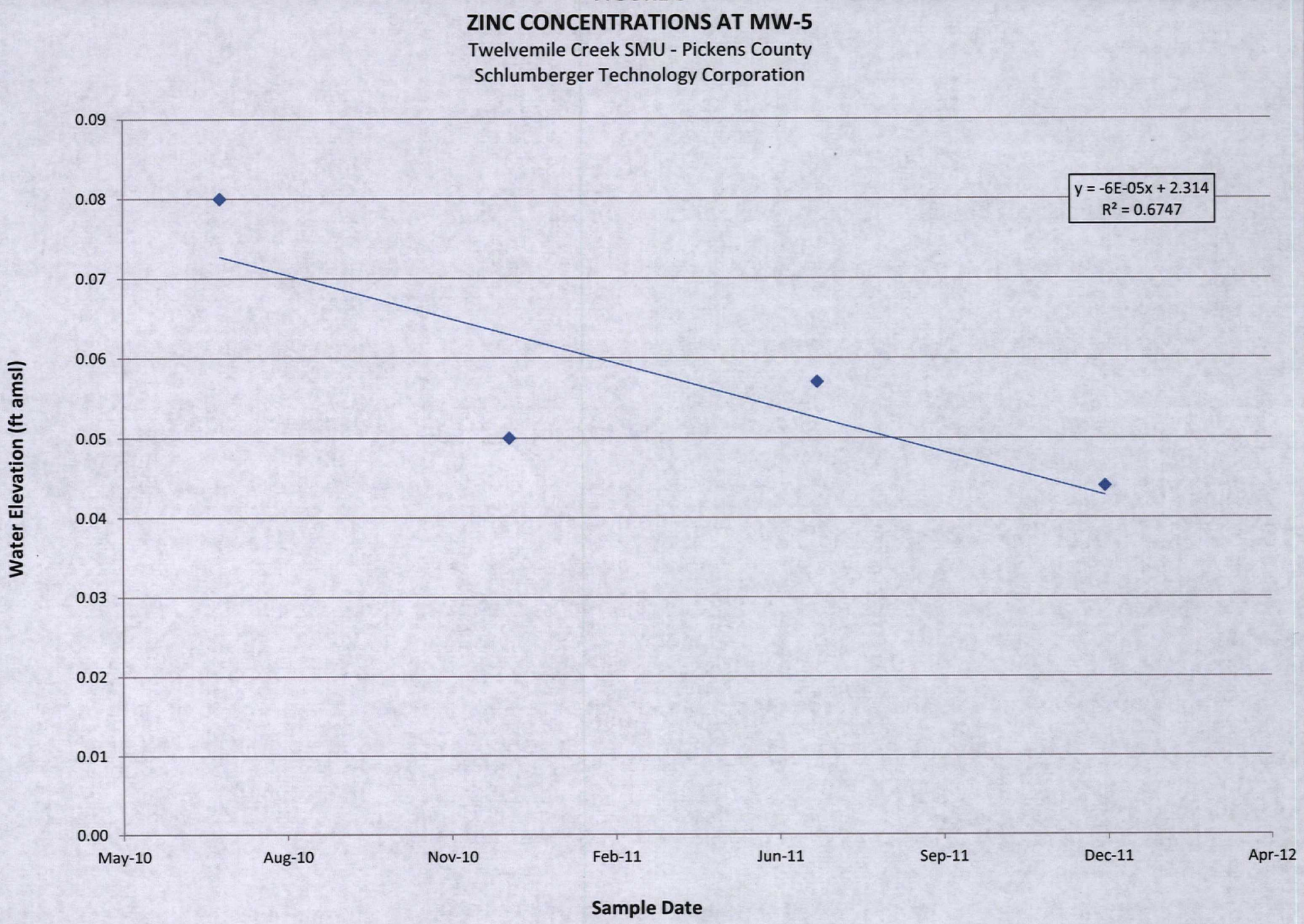
FIGURE 5

NICKEL CONCENTRATIONS AT MW-5

Twelvemile Creek SMU - Pickens County

Schlumberger Technology Corporation




ZINC CONCENTRATIONS AT MW-5
Twelvemile Creek SMU - Pickens County
Schlumberger Technology Corporation
y = -6E-05x + 2.314
R² = 0.6747
Water Elevation (ft amsl)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
May-10
Aug-10
Nov-10
Feb-11
Jun-11
Sep-11
Dec-11
Apr-12
Sample Date

APPENDIX A

LABORATORY ANALYTICAL REPORTS

ROGERS & CALLCOTT
LABORATORY SERVICES

Laboratory Services Report

Client	Schlumberger Technology Corp. - Sangamo-TMC C/O Patrick Sanderson, Rogers & Callcott 205 Industrial Blvd Sugar Land, TX 77478	**Project:** **Work Order:** **Received:**	Groundwater 2090581 09/20/2012 07:45

Dear Client:

Rogers and Callcott appreciates the opportunity to be of service to you. The attached laboratory services report includes analytical results and chain of custody for samples that were received on September 20, 2012. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all analyses performed under NELAP certification have complied with all the requirements for the NELAC standard. The analyses met the QA/QC confidence interval for each test method unless otherwise qualified. Estimated uncertainty is available upon request.

Privileged / Confidential information may be contained in this report and is intended only for the use of the addressee. If you are not the addressee, or the person responsible for delivering to the person addressed, you may not copy or deliver this message to anyone else. If you receive this message by mistake, please notify Rogers and Callcott immediately.

We strive to provide excellent service to our clients. Please contact Amy Ashley, your Project Manager, at amy.ashley@rogersandcallcott.com or (864)-335-4962 if you have any questions about this report.

CC: George Maalouf- R&C

Report Approved By:

Amy L. Ashley

Amy Ashley
Project Manager

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ROGERS & CALLCOTT
LABORATORY SERVICES

Laboratory Services Report

South Carolina Laboratory Identification 23105
South Carolina Mobile Lab Identification 40572
North Carolina Laboratory Certification Number 27
NELAP Laboratory Identification E87822

Client Schlumberger Technology Corp. - Sangamo-TMC
C/O Patrick Sanderson, Rogers & Callcott
205 Industrial Blvd
Sugar Land, TX 77478

Project: Groundwater
Work Order: 2090581
Received: 09/20/2012 07:45

Sample Number	Sample Description	Matrix	Sampled	Type
2090581-01	MW-1	Ground Water	09/19/12 13:38	Grab
2090581-02	MW-1	Ground Water	09/19/12 14:19	Grab
2090581-03	MW-5	Ground Water	09/19/12 15:04	Grab
2090581-04	MW-5	Ground Water	09/19/12 16:53	Grab
2090581-05	MW-1	Ground Water	09/19/12 14:22	Grab
2090581-06	MW-1	Ground Water	09/19/12 14:36	Grab
2090581-07	MW-5	Ground Water	09/19/12 16:58	Grab
2090581-08	MW-5	Ground Water	09/19/12 17:02	Grab
2090581-09	Equipment Blank	Ground Water	09/19/12 16:03	Grab

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LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Sample Data

Sample Number 2090581-01
Sample Description MW-1 collected on 09/19/12 13:38

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Depth to Water	**66.26**	0.00	Ft	1.00	09/19/12 13:38	-		BCS	B2I0476

Sample Number 2090581-02
Sample Description MW-1 collected on 09/19/12 14:19

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Dissolved Oxygen	**0.6**	0.1	mg/L	1.00	09/19/12 14:19	SM 4500 OG		BCS	B2I0476
Oxidation Reduction Potential	**24.2**	0.0	mV	1.00	09/19/12 14:19	Field Screen		BCS	B2I0476
pH	**7.0**	0.1	pH Units	1.00	09/19/12 14:19	EPA 9040C		BCS	B2I0476
Specific Conductance at 25 C	**162**	10.0	umhos/cm	1.00	09/19/12 14:19	EPA 9050A		BCS	B2I0476
Temperature	**21.2**	0.0	°C	1.00	09/19/12 14:19	SM 2550B		BCS	B2I0476
Turbidity (Field)	**6.2**	5.0	NTU	1.00	09/19/12 14:19	Field Screen		BCS	B2I0476

Sample Number 2090581-03
Sample Description MW-5 collected on 09/19/12 15:04

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Depth to Water	**64.15**	0.00	Ft	1.00	09/19/12 15:04	-		BCS	B2I0476

Sample Number 2090581-04
Sample Description MW-5 collected on 09/19/12 16:53

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Dissolved Oxygen	**0.6**	0.1	mg/L	1.00	09/19/12 16:53	SM 4500 OG		BCS	B2I0476
Oxidation Reduction Potential	**161**	0.0	mV	1.00	09/19/12 16:53	Field Screen		BCS	B2I0476
pH	**5.3**	0.1	pH Units	1.00	09/19/12 16:53	EPA 9040C		BCS	B2I0476
Specific Conductance at 25 C	**196**	10.0	umhos/cm	1.00	09/19/12 16:53	EPA 9050A		BCS	B2I0476
Temperature	**18.3**	0.0	°C	1.00	09/19/12 16:53	SM 2550B		BCS	B2I0476
Turbidity (Field)	**11.4**	5.0	NTU	1.00	09/19/12 16:53	Field Screen		BCS	B2I0476

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LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Sample Number 2090581-05
Sample Description MW-1 collected on 09/19/12 14:22

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Total Metals									
Antimony	ND	0.005	mg/L	1.00	10/01/12 12:49	EPA 6020A		MER	B2J0003
Arsenic	ND	0.005	mg/L	1.00	09/20/12 15:59	EPA 6020A		MER	B2I0484
Barium	**0.041**	0.010	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Beryllium	ND	0.004	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Cadmium	ND	0.004	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Chromium	ND	0.010	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Cobalt	ND	0.010	mg/L	1.00	09/20/12 15:59	EPA 6020A		MER	B2I0484
Copper	ND	0.004	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Lead	ND	0.002	mg/L	1.00	09/20/12 15:59	EPA 6020A		MER	B2I0484
Nickel	**0.046**	0.020	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Selenium	ND	0.050	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Silver	ND	0.010	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Thallium	ND	0.002	mg/L	1.00	09/20/12 15:59	EPA 6020A		MER	B2I0484
Vanadium	ND	0.010	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547
Zinc	ND	0.010	mg/L	1.00	09/25/12 10:13	EPA 6010C		KFJ	B2I0547

Sample Number 2090581-06
Sample Description MW-1 collected on 09/19/12 14:36

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
PCBs									
PCB-1016	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650
PCB-1221	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650
PCB-1232	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650
PCB-1242	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650
PCB-1248	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650
PCB-1254	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650
PCB-1260	ND	0.500	ug/L	1.00	10/05/12 01:59	EPA 8082A		RKH	B2I0650

Surrogates	%REC	%REC Limits	Flag
2,4,5,6-Tetrachloro-m-xylene	95	60-130	
Decachlorobiphenyl	49	30-150	

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LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Sample Number 2090581-07
Sample Description MW-5 collected on 09/19/12 16:58

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Total Metals									
Antimony	ND	0.005	mg/L	1.00	10/01/12 12:50	EPA 6020A		MER	B2J0003
Arsenic	ND	0.005	mg/L	1.00	09/20/12 16:03	EPA 6020A		MER	B2I0484
Barium	**0.045**	0.010	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Beryllium	ND	0.004	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Cadmium	ND	0.004	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Chromium	ND	0.010	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Cobalt	**0.036**	0.010	mg/L	1.00	09/20/12 16:03	EPA 6020A		MER	B2I0484
Copper	**0.004**	0.004	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Lead	ND	0.002	mg/L	1.00	09/20/12 16:03	EPA 6020A		MER	B2I0484
Nickel	**0.074**	0.020	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Selenium	ND	0.050	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Silver	ND	0.010	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Thallium	ND	0.002	mg/L	1.00	09/20/12 16:03	EPA 6020A		MER	B2I0484
Vanadium	ND	0.010	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547
Zinc	**0.044**	0.010	mg/L	1.00	09/25/12 10:15	EPA 6010C		KFJ	B2I0547

Sample Number 2090581-08
Sample Description MW-5 collected on 09/19/12 17:02

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
PCBs									
PCB-1016	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600
PCB-1221	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600
PCB-1232	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600
PCB-1242	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600
PCB-1248	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600
PCB-1254	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600
PCB-1260	ND	0.500	ug/L	1.00	09/27/12 16:44	EPA 8082A		RKH	B2I0600

Surrogates	%REC	%REC Limits	Flag
2,4,5,6-Tetrachloro-m-xylene	87	60-130	
Decachlorobiphenyl	68	30-150	

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LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Sample Number 2090581-09
Sample Description Equipment Blank collected on 09/19/12 16:03

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Total Metals									
Antimony	ND	0.005	mg/L	1.00	10/01/12 12:58	EPA 6020A		MER	B2J0003
Arsenic	ND	0.005	mg/L	1.00	09/20/12 16:19	EPA 6020A		MER	B2I0484
Barium	ND	0.010	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Beryllium	ND	0.004	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Cadmium	ND	0.004	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Chromium	ND	0.010	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Cobalt	ND	0.010	mg/L	1.00	09/20/12 16:19	EPA 6020A		MER	B2I0484
Copper	ND	0.004	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Lead	ND	0.002	mg/L	1.00	09/20/12 16:19	EPA 6020A		MER	B2I0484
Nickel	ND	0.020	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Selenium	ND	0.050	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Silver	ND	0.010	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Thallium	ND	0.002	mg/L	1.00	09/20/12 16:19	EPA 6020A		MER	B2I0484
Vanadium	ND	0.010	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
Zinc	ND	0.010	mg/L	1.00	09/25/12 10:18	EPA 6010C		KFJ	B2I0547
PCBs									
PCB-1016	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600
PCB-1221	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600
PCB-1232	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600
PCB-1242	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600
PCB-1248	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600
PCB-1254	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600
PCB-1260	ND	0.500	ug/L	1.00	09/27/12 18:17	EPA 8082A		RKH	B2I0600

Surrogates	%REC	%REC Limits	Flag
2,4,5,6-Tetrachloro-m-xylene	88	60-130	
Decachlorobiphenyl	68	30-150	

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Total Metals
Quality Control Summary

Parameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
Batch B2I0484 - EPA 3005A Mod										
Blank (B2I0484-BLK1)										
Arsenic	ND	0.005	mg/L							
Cobalt	ND	0.010	mg/L							
Lead	ND	0.002	mg/L							
Thallium	ND	0.002	mg/L							
LCS (B2I0484-BS1)										
Arsenic	0.062	0.005	mg/L	0.0600		103	80-120			
Cobalt	0.060	0.010	mg/L	0.0600		99	80-120			
Lead	0.061	0.002	mg/L	0.0600		102	80-120			
Thallium	0.061	0.002	mg/L	0.0600		102	80-120			
Matrix Spike (B2I0484-MS1)	**Source: 2090581-07**									
Arsenic	0.065	0.005	mg/L	0.0600	ND	108	75-125			
Cobalt	0.096	0.010	mg/L	0.0600	0.036	101	75-125			
Lead	0.064	0.002	mg/L	0.0600	ND	105	75-125			
Thallium	0.064	0.002	mg/L	0.0600	ND	106	75-125			
Matrix Spike Dup (B2I0484-MSD1)	**Source: 2090581-07**									
Arsenic	0.065	0.005	mg/L	0.0600	ND	109	75-125	0.6	20	
Cobalt	0.098	0.010	mg/L	0.0600	0.036	105	75-125	2	20	
Lead	0.065	0.002	mg/L	0.0600	ND	107	75-125	2	20	
Thallium	0.065	0.002	mg/L	0.0600	ND	107	75-125	2	20	
Post Spike (B2I0484-PS1)	**Source: 2090581-07**									
Arsenic	0.072		mg/L	0.0700	ND	103	80-120			
Cobalt	0.101		mg/L	0.0700	0.033	97	80-120			
Lead	0.072		mg/L	0.0700	ND	102	80-120			
Thallium	0.071		mg/L	0.0700	ND	101	80-120			
Batch B2I0547 - EPA 3005A										
Blank (B2I0547-BLK1)										
Barium	ND	0.010	mg/L							
Beryllium	ND	0.004	mg/L							
Cadmium	ND	0.004	mg/L							
Chromium	ND	0.010	mg/L							
Copper	ND	0.004	mg/L							
Nickel	ND	0.020	mg/L							

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Total Metals
Quality Control Summary

Parameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
Batch B2I0547 - EPA 3005A										
Blank (B2I0547-BLK1)										
Selenium	ND	0.050	mg/L							
Silver	ND	0.010	mg/L							
Thallium	ND	0.010	mg/L							
Zinc	ND	0.010	mg/L							
LCS (B2I0547-BS1)										
Antimony	0.49	0.010	mg/L	0.500		98	80-120			
Beryllium	0.48	0.004	mg/L	0.500		96	80-120			
Cadmium	0.50	0.004	mg/L	0.500		99	80-120			
Chromium	0.49	0.010	mg/L	0.500		97	80-120			
Copper	0.49	0.004	mg/L	0.500		98	80-120			
Nickel	0.49	0.020	mg/L	0.500		98	80-120			
Selenium	0.48	0.050	mg/L	0.500		97	80-120			
Silver	0.50	0.010	mg/L	0.500		99	80-120			
Vanadium	0.49	0.010	mg/L	0.500		97	80-120			
Zinc	0.48	0.010	mg/L	0.500		97	80-120			
Matrix Spike (B2I0547-MS1)	**Source: 2090626-12**									
Antimony	0.50	0.010	mg/L	0.500	ND	98	75-125			
Beryllium	0.48	0.004	mg/L	0.500	ND	96	75-125			
Cadmium	0.49	0.004	mg/L	0.500	ND	99	75-125			
Chromium	0.48	0.010	mg/L	0.500	ND	97	75-125			
Copper	0.49	0.004	mg/L	0.500	ND	98	75-125			
Nickel	0.49	0.020	mg/L	0.500	ND	96	75-125			
Selenium	0.47	0.050	mg/L	0.500	ND	95	75-125			
Silver	0.49	0.010	mg/L	0.500	ND	98	75-125			
Thallium	0.48	0.010	mg/L	0.500	ND	96	75-125			
Zinc	0.49	0.010	mg/L	0.500	ND	97	75-125			
Matrix Spike Dup (B2I0547-MSD1)	**Source: 2090626-12**									
Antimony	0.50	0.010	mg/L	0.500	ND	99	75-125	0.7	20	
Beryllium	0.48	0.004	mg/L	0.500	ND	96	75-125	0.5	20	
Cadmium	0.50	0.004	mg/L	0.500	ND	99	75-125	0.4	20	
Chromium	0.49	0.010	mg/L	0.500	ND	98	75-125	0.9	20	
Copper	0.49	0.004	mg/L	0.500	ND	97	75-125	0.4	20	
Nickel	0.50	0.020	mg/L	0.500	ND	97	75-125	0.8	20	
Selenium	0.47	0.050	mg/L	0.500	ND	94	75-125	0.9	20	

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Total Metals
Quality Control Summary

arameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
atch B2I0547 - EPA 3005A										
atrix Spike Dup (B2I0547-MSD1)	**Source: 2090626-12**									
ilver	0.49	0.010	mg/L	0.500	ND	98	75-125	0.3	20	
anadium	0.49	0.010	mg/L	0.500	ND	97	75-125	0.3	20	
ic	0.50	0.010	mg/L	0.500	ND	99	75-125	2	20	
st Spike (B2I0547-PS1)	**Source: 2090626-12**									
rium	0.50		mg/L	0.500	ND	99	80-120			
ryllium	0.49		mg/L	0.500	ND	97	80-120			
Cadmium	0.50		mg/L	0.500	ND	100	80-120			
romium	0.49		mg/L	0.500	ND	99	80-120			
pper	0.50		mg/L	0.500	ND	100	80-120			
ickel	0.50		mg/L	0.500	ND	98	80-120			
elenium	0.48		mg/L	0.500	ND	95	80-120			
ver	0.49		mg/L	0.500	ND	98	80-120			
nadium	0.49		mg/L	0.500	ND	98	80-120			
Zinc	0.50		mg/L	0.500	ND	99	80-120			
atch B2J0003 - EPA 3005A Mod										
ank (B2J0003-BLK1)										
timony	ND	0.005	mg/L							
S (B2J0003-BS1)										
timony	0.020	0.005	mg/L	0.0200		102	80-120			
atrix Spike (B2J0003-MS1)	**Source: 2090581-07**									
timony	0.020	0.005	mg/L	0.0200	ND	99	75-125			
atrix Spike Dup (B2J0003-MSD1)	**Source: 2090581-07**									
timony	0.021	0.005	mg/L	0.0200	ND	105	75-125	7	20	
st Spike (B2J0003-PS1)	**Source: 2090581-07**									
timony	0.026		mg/L	0.0250	ND	103	80-120			

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

PCBs
Quality Control Summary

Parameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
Batch B2I0600 - EPA 3510C - GC										
Blank (B2I0600-BLK1)										
PCB-1016	ND	0.500	ug/L							
PCB-1221	ND	0.500	ug/L							
PCB-1232	ND	0.500	ug/L							
PCB-1242	ND	0.500	ug/L							
PCB-1248	ND	0.500	ug/L							
PCB-1254	ND	0.500	ug/L							
PCB-1260	ND	0.500	ug/L							
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*82*	*60-130*			
Surrogate: Decachlorobiphenyl						*58*	*30-150*			
LCS (B2I0600-BS1)										
PCB-1248	2.60	0.500	ug/L	2.50		104	70-130			
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*85*	*60-130*			
Surrogate: Decachlorobiphenyl						*42*	*30-150*			
Matrix Spike (B2I0600-MS1) Source: 2090581-08										
PCB-1248	2.37	0.500	ug/L	2.50	ND	95	60-130			
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*92*	*60-130*			
Surrogate: Decachlorobiphenyl						*71*	*30-150*			
Matrix Spike Dup (B2I0600-MSD1) Source: 2090581-08										
PCB-1248	2.25	0.500	ug/L	2.50	ND	90	60-130	5	20	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*89*	*60-130*			
Surrogate: Decachlorobiphenyl						*63*	*30-150*			
Batch B2I0650 - EPA 3510C - GC										
Blank (B2I0650-BLK1)										
PCB-1016	ND	0.500	ug/L							
PCB-1221	ND	0.500	ug/L							
PCB-1232	ND	0.500	ug/L							
PCB-1242	ND	0.500	ug/L							
PCB-1248	ND	0.500	ug/L							
PCB-1254	ND	0.500	ug/L							
PCB-1260	ND	0.500	ug/L							
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*90*	*60-130*			
Surrogate: Decachlorobiphenyl						*20*	*30-150*			*R*

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LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

PCBs
Quality Control Summary

ameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
atch B2I0650 - EPA 3510C - GC										
S (B2I0650-BS1)										
-1248	2.84	0.500	ug/L	2.50		114	70-130			
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*99*	*60-130*			
Surrogate: Decachlorobiphenyl						*40*	*30-150*			
S Dup (B2I0650-BSD1)										
-1248	2.60	0.500	ug/L	2.50		104	70-130	9	20	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*89*	*60-130*			
Surrogate: Decachlorobiphenyl						*60*	*30-150*			

Sample Preparation Data

rameter	Batch	Sample ID	Prepared	Analyst
A 3005A ICP Digestion				
EPA 3005A	B2I0547	2090581-05	09/24/2012 12:21	KFJ
EPA 3005A	B2I0547	2090581-07	09/24/2012 12:21	KFJ
EPA 3005A	B2I0547	2090581-09	09/24/2012 12:21	KFJ
A 3005A ICPMS Digestion				
EPA 3005A Mod	B2I0484	2090581-05	09/20/2012 10:43	MER
EPA 3005A Mod	B2J0003	2090581-05	10/01/2012 08:04	MER
EPA 3005A Mod	B2I0484	2090581-07	09/20/2012 10:43	MER
EPA 3005A Mod	B2J0003	2090581-07	10/01/2012 08:04	MER
EPA 3005A Mod	B2I0484	2090581-09	09/20/2012 10:43	MER
EPA 3005A Mod	B2J0003	2090581-09	10/01/2012 08:04	MER
A 3510 Extraction				
EPA 3510C - GC	B2I0650	2090581-06	09/26/2012 14:30	DBB
EPA 3510C - GC	B2I0600	2090581-08	09/25/2012 10:15	CGW
EPA 3510C - GC	B2I0600	2090581-09	09/25/2012 10:15	CGW

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090581
Sugar Land, TX 77478		Reported:	10/18/12 10:01

Data Qualifiers and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not reported
RPD	Relative Percent Difference
R	The surrogate was not within quality control limits.

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LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

Client Name: Schlumberger-TMC

Address: Cateechee, SC

Report To:

Telephone No. FAX No.

PO No. Project No. 2010-012

						N	N	N					Filtered (Yes/No)
						Y	Y	Y					Cooled (Yes/No)
						P	G	G					Container Type (P/G)
						500 mL	2.5 L	4.8 L					Container Volume
						G	G	G					Sample Type (Grab/Composite)
						GW	GW	GW					Sample Source (WW, GW, DW, Other)
						N	N	N					Sample Source Chlorinated (Yes/No)
						NA	~~NEG~~ NA	~~NEG~~ NA	HRD 10.9				Lab Receipt Cl₂ Check mcs 9-20-12
						<2	7	7					Lab Receipt pH Check
						B	A	A					Preserved (Code)

A–None D–NaOH G–Boric Acid
B–HNO_3 E–HCL H–Ascorbic Acid
C–H_2SO_4 F–$Na_2S_2O_3$ I– ____

Rogers & Callcott Lab No.	Yr. 12 Date	Time	Sample Description	Total Number of Containers	PARAMETERS	Total Metals *	PCBs **	PCBs **					COMMENTS:
-05	9/19	1422	MW-1	1		1							* 15 Metals: Sb, As, Ba, Be, Cd, Cr, Co, Cu,
-06		1436	1	1			1						Pb, Ni, Se, Ag, Tl, V, Zn
-07		1658	MW-5	1		1							** 7 Aroclors: 1016, 1221, 1232, 1242, 1248,
-08		1702	1	1				1					1254, 1260
-09		1603	Equipment Blank	2		1	1						
													Field data collected -01 through -04

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.) Shipper Name & #	Date/Time
① [signature]	9/20/2012 0705	② Secure Area	
Relinquished by (Sig.) ③ Secure Area		Received by (Sig.) ④ [signature] Shipper Name & #	9.20.12 0745
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #	
Seal # at'chd by ○	Recvd. Intact by ○	Seal # at'chd by ○	Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt 4.2 °C

Form Revised July 2008 R/C COC FORM

FIELD DATA LOG FOR GROUND WATER SAMPLING

ROGERS & CALLCOTT ENGINEERS, INC.

Well Number: MW-1 ☐ Development ☒ Purging

Date: 9/19/2012 Field Personnel: BCS

Site Name/Location: Schlumberger - TMC

Page 1 of 2

For Low Flow Sampling: Page 1 of 1

Method of Well Evacuation

Pump
- ☐ Grundfos
- ☐ Submersible
- ☐ Peristaltic
- ☒ Bladder
- ☐ Waterra
- ☐ Continuous (Recovery Well)
- ☐ _____

Bailer
- ☐ Non Disposable Teflon
- ☐ Disposable Teflon
- ☐ Disposable Poly
- ☐ Dedicated Teflon
- ☐ Dedicated PVC

One Volume Multiplier (gal/ft) = $\pi r^2 h$ (7.48) (r in feet)
Well Diameter (gal/ft.) 1"= 0.041; 2"= 0.163; 3"= 0.367
4"= 0.653; 6"= 1.470

Water Volume Calculations

Initial Depth to Ground Water (a): 66.26 @ 1338
Total Depth of Well (b): 70.99 on 3/13/2012
Length of Water Column in Well (b-a): 4.73
Well Casing Diameter (inches): 2"
Depth to Immiscible Layer: NA

# of Casings	Gallons to be Removed	Gallons / ~~mLs~~ Removed
1 Casing Vol = (b-a) x Multiplier	NA	
3 Casing Vol		300

Circle One that Applies

Measuring Point: TOC / Ground Surface
Riser Material: PVC / Steel / Teflon
Steel Protective Casing? Yes / No
Bollards? Yes / No
Flush Mount? Yes / No
Well Locked? Yes / No
Well Pad Condition? Okay / _____
Well Integrity Satisfactory? Okay / _____
Vegetation: Overgrown/ Moderate/ Light/ None

Water Removal / Field Analysis Data

Date	Time	Increment	Removal Rate (gal/m) or ~~(ml/m)~~	Water Level, (feet)	BCS 10/15/2012 Water Volume Removed ~~(gal)~~ or (ml)	pH (units) ±0.1-Stable	Temp (°C)	Conductivity (uS/cm) 10%-Stable	Dissolved Oxygen (mg/L)	Hydrogen Sulfide (ppm)	ORP (mVolts)	Odor (Subj*)	Turbidity (NTU)	Comments
9/19/2012	1404	NA	20	66.26	0.0	7.03	19.67	161.3	0.78	NA	12.1	1	12.1	
	1409	1	20	67.24	100	7.03	20.81	163.6	0.60		21.2	1	7.61	
	1414	2	20	67.37	200	7.05	21.13	161.6	0.69		24.1	1	6.18	
	1419	3	20	67.52	300	7.03	21.23	161.7	0.65		24.2	1	6.21	

Bradley Cox 9/19/2012

Weather Conditions/~Temp: Partly Cloudy / 70's °F

* Subjective (1) None (2) Slight (3) Moderate (4) Strong

Well Yield: (Low/ Moderate/ High) Sample Clarity: Clear Precipitate: None Fe^{+2} mg/L= NA

Sample Collection Time Metals - 1422 ; PCBs - 1436

Comments _____

Reviewed by: _____ Date: _____

Revised 2/3/09

Well Number: MW-5

☐ Development
☒ Purging

FIELD DATA LOG FOR GROUND WATER SAMPLING

ROGERS & CALLCOTT ENGINEERS, INC.

Date: 9/19/2012 Field Personnel: BCS

Page 2 of 2

Site Name/Location: Schlumberger - TMC

For Low Flow Sampling: Page 1 of 1

Method of Well Evacuation

Pump	Bailer
☐ Grundfos	☐ Non Disposable Teflon
☐ Submersible	☐ Disposable Teflon
☐ Peristaltic	☐ Disposable Poly
☒ Bladder	☐ Dedicated Teflon
☐ Waterra	☐ Dedicated PVC
☐ Continuous (Recovery Well)	
☐	

One Volume Multiplier (gal/ft) = $\pi r^2 h$ (7.48) (r in feet)
Well Diameter (gal/ft.) 1"= 0.041; 2"= 0.163; 3"= 0.367
4"= 0.653; 6"= 1.470

Water Volume Calculations

Initial Depth to Ground Water (a): 64.15 @ 1504
Total Depth of Well (b): 70.25 on 3/13/2012
Length of Water Column in Well (b-a): 6.10
Well Casing Diameter (inches): 2"
Depth to Immiscible Layer: NA 365 9/19/2012

# of Casings	Gallons to be Removed	~~Gallons~~ / mLs Removed
1 Casing Vol = (b-a) x Multiplier	NA	
3 Casing Vol		3500

Circle One that Applies

Measuring Point: TOC / Ground Surface
Riser Material: PVC / Steel / Teflon
Steel Protective Casing? Yes / No
Bollards? Yes / No
Flush Mount? Yes / No
Well Locked? Yes / No
Well Pad Condition? Okay / _____
Well Integrity Satisfactory? Okay / _____
Vegetation: Overgrown/ Moderate/ Light/ None

Water Removal / Field Analysis Data

Date	Time	Increment	Removal Rate (gal/m) or (ml/m)	Water Level, (feet)	Water Volume Removed (gal) or (ml)	pH (units) ±0.1-Stable	Temp (°C)	Conductivity (uS/cm) 10%-Stable	Dissolved Oxygen (mg/L)	Hydrogen Sulfide (ppm)	ORP (mVolts)	Odor (Subj*)	Turbidity (NTU)	Comments
9/19/2012	1618	NA	100	64.15	0.0	5.55	19.47	40.0	4.74	NA	39.0	1	63.9	
	1623	1	100	64.35	500	5.34	17.83	41.9	4.24		115.9	1	58.0	
	1628	2	100	64.43	1000	5.26	18.11	90.4	2.90		148.9	1	45.6	
	1633	3	100	64.55	1500	5.23	17.81	135.5	1.46		157.2	1	60.6	
	1638	4	100	64.61	2000	5.24	17.77	210.6	0.69		166.3	1	36.5	
	1643	5	100	64.69	2500	5.27	18.04	204.0	0.56		164.5	1	17.0	
	1648	6	100	64.76	3000	5.30	18.27	198.7	0.50		162.2	1	14.5	
	1653	7	100	64.83	~~4000~~ 3500	5.31	18.28	196.3	0.65		161.4	1	11.4	

Weather Conditions/~Temp: Partly Cloudy / 70's °F

Brady Callcott 9/19/2012

*Subjective (1) None (2) Slight (3) Moderate (4) Strong

Well Yield: (Low/ Moderate/ High) Sample Clarity: Clear Precipitate: None Fe^{+2} mg/L= NA

Sample Collection Time Metals - 1658 ; PCBs - 1702

Comments

Reviewed by: Date:

Revised 2/3/09

Rogers and Callcott Enginers

Field Meter Calibration Record

Client: Schlumberger - TMC **Date:** 9/19/2012

Conductivity Meter Calibration
EPA 9050A

Meter Make / Model: YSI EC300 SN: 5C01963 Probe: 300-4m 08L100071

Time: 0821 Analyst: BCS Cell Constant 5.01

Chemical Inventory	Conc. of Standard, µmhos/cm @25°C		Actual Reading of Standard, µmhos/cm	Actual Reading of Standard, @ Temperature, °C
P203483	9.41		9.8	21.3
P203484	100.2		100.8	21.3
P203485	996		995	21.2
P203486	SSS conc:	447	446.0	21.4

Temperature compensation for conductivity meter : ø

Note: Temperature is recorded from the conductivity meter for reporting purposes.

pH Meter Calibration
EPA 9040C

Meter Make / Model: YSI pH100 SN: 5C03192 Probe: YSI 605377 10F

Time: 0816 Analyst: BCS Slope: 98.7

Chemical Inventory	Conc. of Buffer, units		Actual Reading of Buffer, units
P201165	4.0		3.99
P201752	7.0		6.99
P201164	10.0		9.97
P201889	SSS conc:	10.0	9.98

Temperature compensation for pH meter : ø

Note: Temperature is recorded from the conductivity meter for reporting purposes.

Turbidity Meter Calibration
Field Screen Method

Meter Make / Model: Hach 2100P SN: 08120C053298 Date of most recent calibration: 9/5/2012

Time: 0828 Analyst: BCS

Chemical Inventory	Assigned Conc. of Standard, NTU	Actual Reading of Standard, NTU
P200097	4.32	4.12
P200098	46.8	48.6
P200099	476	474

Reviewed by: Date:

Revised 03/18/09

Rogers and Callcott Enginers

Continuing Calibration Verification

Client: Schlumberger-TMC

Date: 9/19/2012

Conductivity Meter
EPA 9050A

Meter Make / Model: YSI EC300 SN: 3C01963 Probe: 300-4-m 08L100071

Time	Analyst	Conc. of Standard, µmhos/cm @25°C	Actual Reading of Standard, µmhos/cm
1335	BCS	100.2	101.3 @ 23.9 °C
1708	BCS	996	1000 @ 24.8 °C

pH Meter
EPA 9040C

Meter Make / Model: YSI pH100 SN: 5C03192 Probe: YSI 605377 10F

Time	Analyst	Conc. of Buffer, units	Actual Reading of Buffer, units
1335	BCS	7.0	6.57
1708	BCS	4.0	3.94

Turbidity Meter
Field Screen Method

Meter Make / Model: Hach 2100P SN: 08120C033298

Time	Analyst	Assigned Conc. of Standard, NTU	Actual Reading of Standard, NTU
1335	BCS	46.8	46.5
1708	BCS	4.32	4.28

Field Duplicate

Well ID: MW-1

Time	Analyst	Conductivity, µmhos/cm	pH, units	Turbidity, NTU	Temperature, °C
1419	BCS	159.2	6.99	6.19	21.42

Note: Refer to daily calibration log for instrument calibration and chemical inventory information / documentation.

Reviewed by: _____ Date: _____

Revised 03/18/09

Rogers and Callcott Engineers

Field Multi-Meter Calibration Record

Client: Schlumberger - TMC **Date:** 9/19/2012

Meter Make / Model: Hanna HI9828 SN: 679-203

pH Calibration
EPA 9040C

Time: _____ Analyst: _____ Slope: _____

Chemical Inventory	Expiration Date	Conc. of Buffer, units	Actual Reading, units
		4.0	
		7.0	
		10.0	
		SSS conc:	

Temperature compensation for pH meter : Ø

Note: Temperature is recorded from the conductivity meter for reporting purposes.

ORP Calibration

Time: 0901 Analyst: BCS

Chemical Inventory	Expiration Date	Conc. of Standard @ 25°C mV	Actual Reading, mV	Actual Reading, @ Temperature °C
P202721	11/2016	240	240.0	21.48

Dissolved Oxygen Calibration
SM 4500 OG

Time: 0835 Analyst: BCS

mmHG	DO Meter Reading mg/L	Winkler Titration mlS
753.1 (9/18/2012)	8.5 (9/19/2012)	8.6 (9/18/2012)

Calibrated on 9/19/2012

Revised 02/13/09

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

Sample Receipt Verification

Client: SCHLUMBERGER Date Received: 9.20.12 Work Order: 2090581

Carrier Name: Client FedEx UPS US Mail Courier Field Services Other: _____

Tracking Number: _____

Receipt Criteria	Yes	No	NA	Comments
Shipping container / cooler intact?	X			Damaged Leaking Other:
Custody seals intact?			X	
COC included with samples?	X			
COC signed when relinquished and received?	X			
Sample bottles intact?	X			Damaged Leaking Other:
Sample ID on COC agree with label on bottle(s)?	X			
Date / time on COC agree with label on bottle(s)?	X			
Number of bottles on COC agrees with number of bottles received?	X			
Samples received within holding time?	X			
Sample volume sufficient for analysis?	X			
VOA vials free of headspace (<6mm bubble)?			X	
Samples cooled? Temp at receipt recorded on COC; Temp measured with IR thermometer - SN: 97050067	X			Ice Cold Packs Dry Ice None
Samples requiring pH preservation at proper pH? Note: Samples for metals analysis may be preserved upon receipt in the lab.	X			

If in-house preservation used – record Lot #		
	HCL	
	H_2SO_4	
	HNO_3	
	H_3PO_4	
	NaOH	
	Other	

Comments:

Completed by: KRU

Revised April 2012

ROGERS & CALLCOTT
LABORATORY SERVICES

Laboratory Services Report

Client	Schlumberger Technology Corp. - Sangamo-TMC C/O Patrick Sanderson, Rogers & Callcott 205 Industrial Blvd Sugar Land, TX 77478	**Project:** **Work Order:** **Received:**	Groundwater 2090626 09/20/2012 16:55

Dear Client:

ogers and Callcott appreciates the opportunity to be of service to you. The attached laboratory services report includes analytical results and chain of custody for samples that were received on September 20, 2012. Rogers and Callcott maintains a formal QA/QC program. Unless otherwise noted, all nalyses performed under NELAP certification have complied with all the requirements for the NELAC standard. The analyses met the QA/QC onfidence interval for each test method unless otherwise qualified. Estimated uncertainty is available upon request.

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/e strive to provide excellent service to our clients. Please contact Amy Ashley, your Project Manager, at amy.ashley@rogersandcallcott.com or 864)-335-4962 if you have any questions about this report.

CC: George Maalouf- R&C

Report Approved By:

Amy L. Ashley

Amy Ashley
Project Manager

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426 Fairforest Way, Greenville SC 29607 - PO Box 5655, Greenville SC 29606
Phone 864-232-1556 Fax 864-232-6140
www.rogersandcallcott.com

ROGERS & CALLCOTT
LABORATORY SERVICES

Laboratory Services Report

South Carolina Laboratory Identification 23105
South Carolina Mobile Lab Identification 40572
North Carolina Laboratory Certification Number 27
NELAP Laboratory Identification E87822

Client Schlumberger Technology Corp. - Sangamo-TMC
C/O Patrick Sanderson, Rogers & Callcott
205 Industrial Blvd
Sugar Land, TX 77478

Project: Groundwater
Work Order: 2090626
Received: 09/20/2012 16:55

Sample Number	Sample Description	Matrix	Sampled	Type
2090626-01	MW-4	Ground Water	09/20/12 09:07	Grab
2090626-02	MW-4	Ground Water	09/20/12 09:35	Grab
2090626-03	MW-3	Ground Water	09/20/12 10:11	Grab
2090626-04	MW-3	Ground Water	09/20/12 11:22	Grab
2090626-05	MW-2	Ground Water	09/20/12 12:40	Grab
2090626-06	MW-2	Ground Water	09/20/12 13:10	Grab
2090626-07	MW-4	Ground Water	09/20/12 09:38	Grab
2090626-08	MW-4	Ground Water	09/20/12 10:20	Grab
2090626-09	MW-3	Ground Water	09/20/12 11:25	Grab
2090626-10	MW-3	Ground Water	09/20/12 11:50	Grab
2090626-11	MW-2	Ground Water	09/20/12 13:14	Grab
2090626-12	MW-2	Ground Water	09/20/12 13:39	Grab

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ROGERS & CALLCOTT
LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Sample Data

Sample Number 2090626-01
Sample Description MW-4 collected on 09/20/12 09:07

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Depth to Water	**80.83**	0.00	Ft	1.00	09/20/12 09:07	-		BCS	B2I0512

Sample Number 2090626-02
Sample Description MW-4 collected on 09/20/12 09:35

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Dissolved Oxygen	**9.4**	0.1	mg/L	1.00	09/20/12 09:35	SM 4500 OG		BCS	B2I0512
Oxidation Reduction Potential	**152**	0.0	mV	1.00	09/20/12 09:35	Field Screen		BCS	B2I0512
pH	**5.5**	0.1	pH Units	1.00	09/20/12 09:35	EPA 9040C		BCS	B2I0512
Specific Conductance at 25 C	**21.1**	10.0	umhos/cm	1.00	09/20/12 09:35	EPA 9050A		BCS	B2I0512
Temperature	**17.6**	0.0	°C	1.00	09/20/12 09:35	SM 2550B		BCS	B2I0512
Turbidity (Field)	**6.0**	5.0	NTU	1.00	09/20/12 09:35	Field Screen		BCS	B2I0512

Sample Number 2090626-03
Sample Description MW-3 collected on 09/20/12 10:11

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Depth to Water	**71.40**	0.00	Ft	1.00	09/20/12 10:11	-		BCS	B2I0512

Sample Number 2090626-04
Sample Description MW-3 collected on 09/20/12 11:22

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Dissolved Oxygen	ND	0.1	mg/L	1.00	09/20/12 11:22	SM 4500 OG		BCS	B2I0512
Oxidation Reduction Potential	**-11.6**	0.0	mV	1.00	09/20/12 11:22	Field Screen		BCS	B2I0512
pH	**6.5**	0.1	pH Units	1.00	09/20/12 11:22	EPA 9040C		BCS	B2I0512
Specific Conductance at 25 C	**105**	10.0	umhos/cm	1.00	09/20/12 11:22	EPA 9050A		BCS	B2I0512
Temperature	**16.5**	0.0	°C	1.00	09/20/12 11:22	SM 2550B		BCS	B2I0512
Turbidity (Field)	**7.0**	5.0	NTU	1.00	09/20/12 11:22	Field Screen		BCS	B2I0512

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ROGERS & CALLCOTT
LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Sample Number 2090626-05
Sample Description MW-2 collected on 09/20/12 12:40

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Depth to Water	**56.60**	0.00	Ft	1.00	09/20/12 12:40	-		BCS	B2I0512

Sample Number 2090626-06
Sample Description MW-2 collected on 09/20/12 13:10

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Field Parameters									
Dissolved Oxygen	**0.2**	0.1	mg/L	1.00	09/20/12 13:10	SM 4500 OG		BCS	B2I0512
Oxidation Reduction Potential	**-39.6**	0.0	mV	1.00	09/20/12 13:10	Field Screen		BCS	B2I0512
pH	**6.5**	0.1	pH Units	1.00	09/20/12 13:10	EPA 9040C		BCS	B2I0512
Specific Conductance at 25 C	**197**	10.0	umhos/cm	1.00	09/20/12 13:10	EPA 9050A		BCS	B2I0512
Temperature	**17.5**	0.0	°C	1.00	09/20/12 13:10	SM 2550B		BCS	B2I0512
Turbidity (Field)	**6.9**	5.0	NTU	1.00	09/20/12 13:10	Field Screen		BCS	B2I0512

Sample Number 2090626-07
Sample Description MW-4 collected on 09/20/12 09:38

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
PCBs									
PCB-1016	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600
PCB-1221	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600
PCB-1232	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600
PCB-1242	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600
PCB-1248	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600
PCB-1254	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600
PCB-1260	ND	0.500	ug/L	1.00	09/27/12 18:48	EPA 8082A		RKH	B2I0600

Surrogates	%REC	%REC Limits	Flag
2,4,5,6-Tetrachloro-m-xylene	86	60-130	
Decachlorobiphenyl	20	30-150	R1

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ROGERS & CALLCOTT
LABORATORY SERVICES

Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Sample Number 2090626-08
Sample Description MW-4 collected on 09/20/12 10:20

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Total Metals									
Antimony	ND	0.005	mg/L	1.00	10/01/12 12:59	EPA 6020A		MER	B2J0003
Arsenic	ND	0.005	mg/L	1.00	10/03/12 11:29	EPA 6020A		MER	B2J0059
Barium	ND	0.010	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Beryllium	ND	0.004	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Cadmium	ND	0.004	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Chromium	ND	0.010	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Cobalt	ND	0.010	mg/L	1.00	10/03/12 11:29	EPA 6020A		MER	B2J0059
Copper	ND	0.004	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Lead	ND	0.002	mg/L	1.00	10/03/12 11:29	EPA 6020A		MER	B2J0059
Nickel	ND	0.020	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Selenium	ND	0.050	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Silver	ND	0.010	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Thallium	ND	0.002	mg/L	1.00	10/03/12 11:29	EPA 6020A		MER	B2J0059
Vanadium	ND	0.010	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547
Zinc	ND	0.010	mg/L	1.00	09/25/12 10:20	EPA 6010C		KFJ	B2I0547

Sample Number 2090626-09
Sample Description MW-3 collected on 09/20/12 11:25

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
PCBs									
PCB-1016	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600
PCB-1221	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600
PCB-1232	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600
PCB-1242	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600
PCB-1248	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600
PCB-1254	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600
PCB-1260	ND	0.500	ug/L	1.00	09/27/12 19:19	EPA 8082A		RKH	B2I0600

Surrogates	%REC	%REC Limits	Flag
2,4,5,6-Tetrachloro-m-xylene	97	60-130	
Decachlorobiphenyl	46	30-150	

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Sample Number 2090626-10
Sample Description MW-3 collected on 09/20/12 11:50

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Total Metals									
Antimony	ND	0.005	mg/L	1.00	10/01/12 13:00	EPA 6020A		MER	B2J0003
Arsenic	ND	0.005	mg/L	1.00	10/03/12 11:45	EPA 6020A		MER	B2J0059
Barium	ND	0.010	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Beryllium	ND	0.004	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Cadmium	ND	0.004	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Chromium	ND	0.010	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Cobalt	ND	0.010	mg/L	1.00	10/03/12 11:45	EPA 6020A		MER	B2J0059
Copper	ND	0.004	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Lead	ND	0.002	mg/L	1.00	10/03/12 11:45	EPA 6020A		MER	B2J0059
Nickel	ND	0.020	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Selenium	ND	0.050	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Silver	ND	0.010	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Thallium	ND	0.002	mg/L	1.00	10/03/12 11:45	EPA 6020A		MER	B2J0059
Vanadium	ND	0.010	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547
Zinc	ND	0.010	mg/L	1.00	09/25/12 10:27	EPA 6010C		KFJ	B2I0547

Sample Number 2090626-11
Sample Description MW-2 collected on 09/20/12 13:14

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
PCBs									
PCB-1016	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600
PCB-1221	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600
PCB-1232	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600
PCB-1242	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600
PCB-1248	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600
PCB-1254	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600
PCB-1260	ND	0.500	ug/L	1.00	09/27/12 19:50	EPA 8082A		RKH	B2I0600

Surrogates	%REC	%REC Limits	Flag
2,4,5,6-Tetrachloro-m-xylene	94	60-130	
Decachlorobiphenyl	84	30-150	

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Sample Number 2090626-12
Sample Description MW-2 collected on 09/20/12 13:39

Parameter	Result	Reporting Limit	Units	DF	Analyzed	Method	Flag	Analyst	Batch
Total Metals									
Antimony	ND	0.005	mg/L	1.00	10/01/12 13:01	EPA 6020A		MER	B2J0003
Arsenic	ND	0.005	mg/L	1.00	10/03/12 11:49	EPA 6020A		MER	B2J0059
Barium	ND	0.010	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Beryllium	ND	0.004	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Cadmium	ND	0.004	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Chromium	ND	0.010	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Cobalt	ND	0.010	mg/L	1.00	10/03/12 11:49	EPA 6020A		MER	B2J0059
Copper	ND	0.004	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Lead	ND	0.002	mg/L	1.00	10/03/12 11:49	EPA 6020A		MER	B2J0059
Nickel	ND	0.020	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Selenium	ND	0.050	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Silver	ND	0.010	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Thallium	ND	0.002	mg/L	1.00	10/03/12 11:49	EPA 6020A		MER	B2J0059
Vanadium	ND	0.010	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547
Zinc	ND	0.010	mg/L	1.00	09/25/12 10:00	EPA 6010C		KFJ	B2I0547

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Total Metals
Quality Control Summary

Parameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
Batch B2I0547 - EPA 3005A										
Blank (B2I0547-BLK1)										
Barium	ND	0.010	mg/L							
Beryllium	ND	0.004	mg/L							
Cadmium	ND	0.004	mg/L							
Chromium	ND	0.010	mg/L							
Copper	ND	0.004	mg/L							
Nickel	ND	0.020	mg/L							
Selenium	ND	0.050	mg/L							
Silver	ND	0.010	mg/L							
Vanadium	ND	0.010	mg/L							
Zinc	ND	0.010	mg/L							
LCS (B2I0547-BS1)										
Barium	0.49	0.010	mg/L	0.500		98	80-120			
Beryllium	0.48	0.004	mg/L	0.500		96	80-120			
Cadmium	0.50	0.004	mg/L	0.500		99	80-120			
Chromium	0.49	0.010	mg/L	0.500		97	80-120			
Copper	0.49	0.004	mg/L	0.500		98	80-120			
Nickel	0.49	0.020	mg/L	0.500		98	80-120			
Selenium	0.48	0.050	mg/L	0.500		97	80-120			
Silver	0.50	0.010	mg/L	0.500		99	80-120			
Vanadium	0.49	0.010	mg/L	0.500		97	80-120			
Zinc	0.48	0.010	mg/L	0.500		97	80-120			
Matrix Spike (B2I0547-MS1)	**Source: 2090626-12**									
Barium	0.50	0.010	mg/L	0.500	ND	98	75-125			
Beryllium	0.48	0.004	mg/L	0.500	ND	96	75-125			
Cadmium	0.49	0.004	mg/L	0.500	ND	99	75-125			
Chromium	0.48	0.010	mg/L	0.500	ND	97	75-125			
Copper	0.49	0.004	mg/L	0.500	ND	98	75-125			
Nickel	0.49	0.020	mg/L	0.500	ND	96	75-125			
Selenium	0.47	0.050	mg/L	0.500	ND	95	75-125			
Silver	0.49	0.010	mg/L	0.500	ND	98	75-125			
Vanadium	0.48	0.010	mg/L	0.500	ND	96	75-125			
Zinc	0.49	0.010	mg/L	0.500	ND	97	75-125			

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Total Metals
Quality Control Summary

;ameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
atch B2I0547 - EPA 3005A										
trix Spike Dup (B2I0547-MSD1)	**Source: 2090626-12**									
rium	0.50	0.010	mg/L	0.500	ND	99	75-125	0.7	20	
yllium	0.48	0.004	mg/L	0.500	ND	96	75-125	0.5	20	
mium	0.50	0.004	mg/L	0.500	ND	99	75-125	0.4	20	
omium	0.49	0.010	mg/L	0.500	ND	98	75-125	0.9	20	
opper	0.49	0.004	mg/L	0.500	ND	97	75-125	0.4	20	
kel	0.50	0.020	mg/L	0.500	ND	97	75-125	0.8	20	
enium	0.47	0.050	mg/L	0.500	ND	94	75-125	0.9	20	
ver	0.49	0.010	mg/L	0.500	ND	98	75-125	0.3	20	
anadium	0.49	0.010	mg/L	0.500	ND	97	75-125	0.3	20	
c	0.50	0.010	mg/L	0.500	ND	99	75-125	2	20	
st Spike (B2I0547-PS1)	**Source: 2090626-12**									
ium	0.50		mg/L	0.500	ND	99	80-120			
yllium	0.49		mg/L	0.500	ND	97	80-120			
Cadmium	0.50		mg/L	0.500	ND	100	80-120			
omium	0.49		mg/L	0.500	ND	99	80-120			
per	0.50		mg/L	0.500	ND	100	80-120			
kel	0.50		mg/L	0.500	ND	98	80-120			
Selenium	0.48		mg/L	0.500	ND	95	80-120			
ver	0.49		mg/L	0.500	ND	98	80-120			
nadium	0.49		mg/L	0.500	ND	98	80-120			
Zinc	0.50		mg/L	0.500	ND	99	80-120			
tch B2J0003 - EPA 3005A Mod										
nk (B2J0003-BLK1)										
timony	ND	0.005	mg/L							
S (B2J0003-BS1)										
timony	0.020	0.005	mg/L	0.0200		102	80-120			
trix Spike (B2J0003-MS1)	**Source: 2090581-07**									
timony	0.020	0.005	mg/L	0.0200	ND	99	75-125			

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Total Metals
Quality Control Summary

Parameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
Batch B2J0003 - EPA 3005A Mod										
Matrix Spike Dup (B2J0003-MSD1)	**Source: 2090581-07**									
Antimony	0.021	0.005	mg/L	0.0200	ND	105	75-125	7	20	
Post Spike (B2J0003-PS1)	**Source: 2090581-07**									
Antimony	0.026		mg/L	0.0250	ND	103	80-120			
Batch B2J0059 - EPA 3005A Mod										
Blank (B2J0059-BLK1)										
Arsenic	ND	0.005	mg/L							
Cobalt	ND	0.010	mg/L							
Lead	ND	0.002	mg/L							
Thallium	ND	0.002	mg/L							
LCS (B2J0059-BS1)										
Arsenic	0.065	0.005	mg/L	0.0600		108	80-120			
Cobalt	0.064	0.010	mg/L	0.0600		106	80-120			
Lead	0.064	0.002	mg/L	0.0600		106	80-120			
Thallium	0.064	0.002	mg/L	0.0600		106	80-120			
Matrix Spike (B2J0059-MS1)	**Source: 2090626-08**									
Arsenic	0.064	0.005	mg/L	0.0600	ND	107	75-125			
Cobalt	0.062	0.010	mg/L	0.0600	ND	103	75-125			
Lead	0.062	0.002	mg/L	0.0600	ND	103	75-125			
Thallium	0.062	0.002	mg/L	0.0600	ND	103	75-125			
Matrix Spike Dup (B2J0059-MSD1)	**Source: 2090626-08**									
Arsenic	0.063	0.005	mg/L	0.0600	ND	106	75-125	1	20	
Cobalt	0.061	0.010	mg/L	0.0600	ND	102	75-125	0.3	20	
Lead	0.062	0.002	mg/L	0.0600	ND	103	75-125	0.6	20	
Thallium	0.061	0.002	mg/L	0.0600	ND	102	75-125	1	20	
Post Spike (B2J0059-PS1)	**Source: 2090626-08**									
Arsenic	0.073		mg/L	0.0700	ND	104	80-120			
Cobalt	0.070		mg/L	0.0700	ND	100	80-120			
Lead	0.071		mg/L	0.0700	ND	101	80-120			
Thallium	0.071		mg/L	0.0700	ND	101	80-120			

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

PCBs
Quality Control Summary

Parameter	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flags
Batch B2I0600 - EPA 3510C - GC										
Blank (B2I0600-BLK1)										
PCB-1016	ND	0.500	ug/L							
PCB-1221	ND	0.500	ug/L							
PCB-1232	ND	0.500	ug/L							
PCB-1242	ND	0.500	ug/L							
PCB-1248	ND	0.500	ug/L							
PCB-1254	ND	0.500	ug/L							
PCB-1260	ND	0.500	ug/L							
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*82*	*60-130*			
Surrogate: Decachlorobiphenyl						*58*	*30-150*			
LCS (B2I0600-BS1)										
PCB-1248	2.60	0.500	ug/L	2.50		104	70-130			
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*85*	*60-130*			
Surrogate: Decachlorobiphenyl						*42*	*30-150*			
Matrix Spike (B2I0600-MS1) Source: 2090581-08										
PCB-1248	2.37	0.500	ug/L	2.50	ND	95	60-130			
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*92*	*60-130*			
Surrogate: Decachlorobiphenyl						*71*	*30-150*			
Matrix Spike Dup (B2I0600-MSD1) Source: 2090581-08										
PCB-1248	2.25	0.500	ug/L	2.50	ND	90	60-130	5	20	
Surrogate: 2,4,5,6-Tetrachloro-m-xylene						*89*	*60-130*			
Surrogate: Decachlorobiphenyl						*63*	*30-150*			

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Sample Preparation Data

Parameter	Batch	Sample ID	Prepared	Analyst
EPA 3005A ICP Digestion				
EPA 3005A	B2I0547	2090626-08	09/24/2012 12:21	KFJ
EPA 3005A	B2I0547	2090626-10	09/24/2012 12:21	KFJ
EPA 3005A	B2I0547	2090626-12	09/24/2012 12:21	KFJ
EPA 3005A ICPMS Digestion				
EPA 3005A Mod	B2J0003	2090626-08	10/01/2012 08:04	MER
EPA 3005A Mod	B2J0059	2090626-08	10/02/2012 16:17	MER
EPA 3005A Mod	B2J0003	2090626-10	10/01/2012 08:04	MER
EPA 3005A Mod	B2J0059	2090626-10	10/02/2012 16:17	MER
EPA 3005A Mod	B2J0003	2090626-12	10/01/2012 08:04	MER
EPA 3005A Mod	B2J0059	2090626-12	10/02/2012 16:17	MER
EPA 3510 Extraction				
EPA 3510C - GC	B2I0600	2090626-07	09/25/2012 10:15	CGW
EPA 3510C - GC	B2I0600	2090626-09	09/25/2012 10:15	CGW
EPA 3510C - GC	B2I0600	2090626-11	09/25/2012 10:15	CGW

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Schlumberger Technology Corp. - Sangamo-TMC		Project:	Groundwater
205 Industrial Blvd		Work Order:	2090626
Sugar Land, TX 77478		Reported:	10/18/12 11:50

Data Qualifiers and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not reported
RPD	Relative Percent Difference
R1	The surrogate was not within quality control limits due to matrix interference.

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LABORATORY SERVICES
P.O. Box 5655, Greenville, SC 29606
Phone (864) 232-1556 Fax (864) 232-6140
Shipping Address: 426 Fairforest Way
Greenville, SC 29607

Client Name Schlumberger-TMC

Address Cateechee, SC

Report To:

Telephone No. FAX No.

PO No. Project No. 2010-012

Rogers & Callcott Lab No.	Yr 12 Date	Time	Sample Description	Total Number of Containers	PARAMETERS: PCBs	Total Metals							COMMENTS:
-07	9/20	0938	MW-4	1	1								* 7 Aroclors: 1016, 1221, 1232, 1242, 1248,
-08		1020	⊥	1		1							1254, 1260
-09		1125	MW-3	1	1								** 15 Metals: Sb, As, Ba, Be, Cd, Cr, Co, Cu,
-10		1150	⊥	1		1							Pb, Ni, Se, Ag, Tl, V, Zn
-11		1314	MW-2	1	1								
-12	⊥	1339 1329	⊥	1		1							-01 through -06
													Field data collected

Filtered (Yes/No)	N	N		
Cooled (Yes/No)	Y	Y		
Container Type (P/G)	G	P		
Container Volume	2.5 L	500 mL		
Sample Type (Grab/Composite)	G	G		
Sample Source (WW, GW, DW, Other)	GW	GW		
Sample Source Chlorinated (Yes/No)	N	N		
Lab Receipt Cl_2 Check	NA	NA		KRU
Lab Receipt pH Check	7	12		9.21
Preserved (Code)	A ~~B~~	B ~~A~~		

A-None B-HNO_3 C-H_2SO_4 D-NaOH E-HCL F-$Na_2S_2O_3$ G-Boric Acid H-Ascorbic Acid I- ____

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.) Shipper Name & #	Date/Time
① [signature]	9/20/2012 1655	② Norma Salley	9-20-12 1655
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

Seal # at'chd by ○ Recvd. Intact by ○ Seal # at'chd by ○ Recvd. Intact by ○

KNOWN HAZARDS ASSOCIATED WITH SAMPLES

Temperature of blank or representative sample
At time of collection ____ °C
At time of lab receipt 3.2 °C

Form Revised July 2008 R/C COC FORM

Well Number: MW-4

☐ Development
☒ Purging

FIELD DATA LOG FOR GROUND WATER SAMPLING

ROGERS & CALLCOTT ENGINEERS, INC.

Date: 9/20/2012 Field Personnel: JES / CRW

Page 1 of 3

Site Name/Location: Schlumberger - TMC

For Low Flow Sampling: Page 1 of 1

Method of Well Evacuation

Pump	Bailer
☐ Grundfos	☐ Non Disposable Teflon
☐ Submersible	☐ Disposable Teflon
☐ Peristaltic	☐ Disposable Poly
☒ Bladder	☐ Dedicated Teflon
☐ Waterra	☐ Dedicated PVC
☐ Continuous (Recovery Well)	
☐	

One Volume Multiplier (gal/ft) = $\pi r^2 h$ (7.48) (r in feet)
Well Diameter (gal/ft.) 1"= 0.041; 2"= 0.163; 3"= 0.367
4"= 0.653; 6"= 1.470

Water Volume Calculations

Initial Depth to Ground Water (a): 80.83 @ 0907
Total Depth of Well (b): 93.14 on 3/13/2012
Length of Water Column in Well (b-a): 12.31
Well Casing Diameter (inches): 2"
Depth to Immiscible Layer: NA

# of Casings	Gallons to be Removed	Gallons / mL Removed
1 Casing Vol = (b-a) x Multiplier	NA	
3 Casing Vol		1700

Circle One that Applies

Measuring Point: TOC / Ground Surface
Riser Material: PVC / Steel / Teflon
Steel Protective Casing? Yes / No
Bollards? Yes / No
Flush Mount? Yes / No
Well Locked? Yes / No
Well Pad Condition? Okay / ____
Well Integrity Satisfactory? Okay / ____
Vegetation: Overgrown/ Moderate/ Light/ None

Water Removal / Field Analysis Data

Date	Time	Increment	Removal Rate (gal/m) or (ml/m)	Water Level, (feet)	Water Volume Removed (gal) or (ml)	pH (units) ±0.1-Stable	Temp (°C)	Conductivity (uS/cm) 10%-Stable	Dissolved Oxygen (mg/L)	Hydrogen Sulfide (ppm)	ORP (mVolts)	Odor (Subj*)	Turbidity (NTU)	Comments
9/20/2012	0915	NA	85	80.83	0.0	5.81	17.52	26.1	9.30	NA	92.0	1	21.3	
	0920	1	85	80.99	425	5.63	17.56	24.6	9.05		124.7	1	6.80	
	0925	2	85	81.02	850	5.57	17.76	21.4	9.21		149.1	1	6.64	
	0930	3	85	81.03	1275	5.52	17.49	21.1	9.26		152.0	1	7.04	
	0935	4	85	81.03	1700	5.50	17.61	21.1	9.42		151.9	1	5.99	

Scott Call 9/20/2012

Weather Conditions/~Temp: Partly Cloudy / 70's °F

* Subjective (1) None (2) Slight (3) Moderate (4) Strong

Well Yield: (Low/ Moderate/ High) Sample Clarity: Clear Precipitate: None Fe^{+2} mg/L= NA

Sample Collection Time PCBs - 0938 ; Metals - 1020

Comments

Reviewed by: Date:

Revised 2/3/09

Well Number: MW-3

☐ Development
☒ Purging

FIELD DATA LOG FOR GROUND WATER SAMPLING

ROGERS & CALLCOTT ENGINEERS, INC.

Date: 9/20/2012 Field Personnel: BCS / LRW

Page 2 of 3

Site Name/Location: Schlumberger - TAC

For Low Flow Sampling: Page 1 of 1

Method of Well Evacuation

Pump	Bailer
☐ Grundfos	☐ Non Disposable Teflon
☐ Submersible	☐ Disposable Teflon
☐ Peristaltic	☐ Disposable Poly
☒ Bladder	☐ Dedicated Teflon
☐ Waterra	☐ Dedicated PVC
☐ Continuous (Recovery Well)	
☐	

One Volume Multiplier (gal/ft) = $\pi r^2 h$ (7.48) (r in feet)
Well Diameter (gal/ft.) 1"= 0.041; 2"= 0.163; 3"= 0.367
4"= 0.653; 6"= 1.470

Water Volume Calculations

Initial Depth to Ground Water (a): 71.40 @ 1011
Total Depth of Well (b): 92.81 on 3/12/2012
Length of Water Column in Well (b-a): 21.41
Well Casing Diameter (inches): 4"
Depth to Immiscible Layer: NA

# of Casings	Gallons to be Removed	Gallons / (mL) Removed
1 Casing Vol = (b-a) x Multiplier	NA	
3 Casing Vol		1500

Circle One that Applies

Measuring Point: (TOC) / Ground Surface
Riser Material: (PVC) / Steel / Teflon
Steel Protective Casing? (Yes) / No
Bollards? (Yes) / No
Flush Mount? Yes / (No)
Well Locked? (Yes) / No
Well Pad Condition? (Okay) / _____
Well Integrity Satisfactory? (Okay) / _____
Vegetation: Overgrown/ (Moderate) Light/ None

Water Removal / Field Analysis Data

Date	Time	Increment	Removal Rate (gal/m) or (ml/m)	Water Level (feet)	Water Volume Removed (gal) or (ml)	pH (units) ±0.1-Stable	Temp (°C)	Conductivity (uS/cm) 10%-Stable	Dissolved Oxygen (mg/L)	Hydrogen Sulfide (ppm)	ORP (mVolts)	Odor (Subj*)	Turbidity (NTU)	Comments
9/20/2012	1107	NA	100	71.40	0.0	6.45	17.15	102.4	3.55	NA	73.6	1	12.5	
	1112	1	100	71.62	500	6.53	17.28	105.1	0.25		2.6	1	8.98	
	1117	2	100	71.75	1000	6.56	16.57	105.7	0.02		-11.9	1	8.48	
	1122	3	100	71.99	1500	6.52	16.52	104.8	0.00		-11.6	1	7.04	
	1152													

9/20/2012

Weather Conditions/~Temp: Partly Cloudy / 70's °F

* Subjective (1) None (2) Slight (3) Moderate (4) Strong

Well Yield: (Low/ (Moderate)/ High) Sample Clarity: Clear Precipitate: None Fe^{+2} mg/L= NA

Sample Collection Time PCBs- ~~1152~~ 1125 ; Metals- 1150
BCS 9/20/2012

Comments

Reviewed by: _____ Date: _____

Revised 2/3/09

Well Number: MW-2 ☐ Development ☒ Purging

FIELD DATA LOG FOR GROUND WATER SAMPLING

ROGERS & CALLCOTT ENGINEERS, INC.

Date: 9/20/2012 Field Personnel: BCS

Page 3 of 3

Site Name/Location: Schlumberger-TMC

For Low Flow Sampling: Page 1 of 1

Method of Well Evacuation

Pump	Bailer
☐ Grundfos	☐ Non Disposable Teflon
☐ Submersible	☐ Disposable Teflon
☐ Peristaltic	☐ Disposable Poly
☒ Bladder	☐ Dedicated Teflon
☐ Waterra	☐ Dedicated PVC
☐ Continuous (Recovery Well)	
☐	

One Volume Multiplier (gal/ft) = $\pi r^2 h$ (7.48) (r in feet)
Well Diameter (gal/ft.) 1"= 0.041; 2"= 0.163; 3"= 0.367
4"= 0.653; 6"= 1.470

Water Volume Calculations

Initial Depth to Ground Water (a): 56.60 @ 1240
Total Depth of Well (b): 66.00 on 3/13/2012
Length of Water Column in Well (b-a): 9.40
Well Casing Diameter (inches): 2"
Depth to Immiscible Layer: NA

# of Casings	Gallons to be Removed	Gallons / mls Removed
1 Casing Vol = (b-a) x Multiplier	NA	
3 Casing Vol		1500

Circle One that Applies

Measuring Point: TOC / Ground Surface
Riser Material: PVC / Steel / Teflon
Steel Protective Casing? Yes / No
Bollards? Yes / No
Flush Mount? Yes / No
Well Locked? Yes / No
Well Pad Condition? Okay / _____
Well Integrity Satisfactory? Okay / _____
Vegetation: Overgrown/ Moderate/ Light/ None

Water Removal / Field Analysis Data

Date	Time	Increment	Removal Rate (gal/m) or (ml/m)	Water Level, (feet)	Water Volume Removed (gal) or (ml)	pH (units) ± 0.1-Stable	Temp (°C)	Conductivity (uS/cm) 10%-Stable	Dissolved Oxygen (mg/L)	Hydrogen Sulfide (ppm)	ORP (mVolts)	Odor (Subj*)	Turbidity (NTU)	Comments
9/20/2012	1255	NA	100	56.60	0.0	6.54	18.27	183.2	1.46	NA	-55.8	1	12.0	
	1300	1	100	56.80	500	6.58	17.51	186.0	0.40		-55.7	1	8.93	
	1305	2	100	56.87	1000	6.53	17.56	188.6	0.38		-50.3	1	10.1	
	1310	3	100	56.88	1500	6.49	17.46	196.8	0.20		-39.6	1	6.86	

[signature] 9/20/2012

Weather Conditions/~Temp: Partly Cloudy / 70's °F

* Subjective (1) None (2) Slight (3) Moderate (4) Strong

Well Yield: (Low/ Moderate/ High) Sample Clarity: Clear Precipitate: None Fe^{+2} mg/L= NA

Sample Collection Time PCBs-1314 ; Metals-1339

Comments

Reviewed by: Date:

Revised 2/3/09

Rogers and Callcott Enginers

Field Meter Calibration Record

Client: Schlumberger - TMC **Date:** 9/20/2012

Conductivity Meter Calibration
EPA 9050A

Meter Make / Model: YSI EC300 SN: 3C01963 Probe: 300-4M 08L100071

Time: 0715 Analyst: BCS Cell Constant 5.02

Chemical Inventory	Conc. of Standard, µmhos/cm @25°C		Actual Reading of Standard, µmhos/cm	Actual Reading of Standard, @ Temperature, °C
PZ03483	9.41		9.8	18.8
PZ03484	100.2		101.0	19.0
PZ03485	996		993	19.1
PZ03486	SSS conc:	447	447.4	18.6

Temperature compensation for conductivity meter : Ø

Note: Temperature is recorded from the conductivity meter for reporting purposes.

pH Meter Calibration
EPA 9040C

Meter Make / Model: YSI pH100 SN: 3C03197 Probe: YSI 605377 10F

Time: 0715 Analyst: BCS Slope: 99.4

Chemical Inventory	Conc. of Buffer, units		Actual Reading of Buffer, units
PZ01165	4.0		3.98
PZ01752	7.0		7.03
PZ01164	10.0		9.97
PZ01889	SSS conc:	10.0	9.98

Temperature compensation for pH meter : Ø

Note: Temperature is recorded from the conductivity meter for reporting purposes.

Turbidity Meter Calibration
Field Screen Method

Meter Make / Model: Hach 2100P SN: 0B120C033298 Date of most recent calibration: 9/5/2012

Time: 0730 Analyst: BCS

Chemical Inventory	Assigned Conc. of Standard, NTU	Actual Reading of Standard, NTU
PZ00097	4.32	4.20
PZ00098	46.8	48.3
PZ00099	476	473

Reviewed by: Date:

Revised 03/18/09

Rogers and Callcott Engineers

Field Multi-Meter Calibration Record

Client: Schlumberger - TMC **Date:** 9/20/2012

Meter Make / Model: Hanna HI9828 SN: 679-203

pH Calibration
EPA 9040C

Time: _____ Analyst: _____ Slope: _____

Chemical Inventory	Expiration Date	Conc. of Buffer, units	Actual Reading, units
		4.0	
		7.0	
		10.0	
		SSS conc:	

Temperature compensation for pH meter : _____

Note: Temperature is recorded from the conductivity meter for reporting purposes.

ORP Calibration

Time: 0723 Analyst: BCS

Chemical Inventory	Expiration Date	Conc. of Standard @ 25°C mV	Actual Reading, mV	Actual Reading, @ Temperature °C
7202721	11/2016	240	240.2	21.09

Dissolved Oxygen Calibration
SM 4500 OG

Time: 0720 Analyst: BCS

mmHG	DO Meter Reading mg/L	Winkler Titration mlS
753.1 (9/18/12)	8.5 (9/18/12)	8.6 (9/18/12)

calibrated on 9/20/2012

Revised 02/13/09

Rogers and Callcott Engineers

Continuing Calibration Verification

Client: Schlumberger - TMC

Date: 9/20/2012

Conductivity Meter
EPA 9050A

Meter Make / Model: YSI EC300 SN: 5C01963 Probe: 300-4m 08L100071

Time	Analyst	Conc. of Standard, µmhos/cm @25°C	Actual Reading of Standard, µmhos/cm
1130	BCS	100.2	101.5 @ 26.7 °C
1324	BCS	996 BCS 10/15/2012	1000 @ 29.3 °C

pH Meter
EPA 9040C

Meter Make / Model: YSI pH100 SN: 5C03192 Probe: YSI 605327 10F

Time	Analyst	Conc. of Buffer, units	Actual Reading of Buffer, units
1130	BCS	7.0	6.83
1324	BCS	4.0	3.96

Turbidity Meter
Field Screen Method

Meter Make / Model: Hach 2100P SN: 08120C033298

Time	Analyst	Assigned Conc. of Standard, NTU	Actual Reading of Standard, NTU
1130	BCS	46.5	46.2
1324	BCS	4.32	4.10

Field Duplicate

Well ID: MW-3

Time	Analyst	Conductivity, µmhos/cm	pH, units	Turbidity, NTU	Temperature, °C
1122	BCS	104.9	6.53	6.98	16.54

Note: Refer to daily calibration log for instrument calibration and chemical inventory information / documentation.

Reviewed by: _____ Date: _____

Revised 03/18/09

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

Sample Receipt Verification

Client: SCHLUMBERGER Date Received: 9.20.12 Work Order: 2090624

Carrier Name: Client FedEx UPS US Mail Courier Field Services Other: _____

Tracking Number: _____

Receipt Criteria	Yes	No	NA	Comments
Shipping container / cooler intact?	X			Damaged Leaking Other:
Custody seals intact?			X	
COC included with samples?	X			
COC signed when relinquished and received?	X			
Sample bottles intact?	X			Damaged Leaking Other:
Sample ID on COC agree with label on bottle(s)?	X			
Date / time on COC agree with label on bottle(s)?	X			
Number of bottles on COC agrees with number of bottles received?	X			
Samples received within holding time?	X			
Sample volume sufficient for analysis?	X			
VOA vials free of headspace (<6mm bubble)?			X	
Samples cooled? Temp at receipt recorded on COC; Temp measured with IR thermometer - SN: 97050067	X			Ice Cold Packs Dry Ice None
Samples requiring pH preservation at proper pH? Note: Samples for metals analysis may be preserved upon receipt in the lab.	X			

If in-house preservation used -- record Lot #	HCL	
	H_2SO_4	
	HNO_3	
	H_3PO_4	
	NaOH	
	Other	

Comments:

Completed by: HRU

Revised April 2012

APPENDIX B

DATA VERIFICATION & QUALITY CONTROL SUMMARY

ROGERS & CALLCOTT
LABORATORY SERVICES

P.O. Box 5655, Greenville, SC 29606
Phone: (864) 232-1556 - FAX: (864) 232-6140

Data Verification

Project: Schlumberger – Twelve Mile Creek Monitoring Wells Collected: September 2012

Work Orders: 2090581 and 2090626

Metals – ICP EPA 6010C		
Initial Calibration	Acceptable	Results within method quality control specifications
Initial Calibration Verification	Acceptable	Results within method quality control specifications
Continuing Calibration Verification	Acceptable	Results within method quality control specifications
Blanks	Acceptable	Initial calibration blank, continuing calibration blank, and batch blank results were less than the RDL.
Interference Check Standard	Acceptable	Results within method quality control specifications
Laboratory Control Sample	Acceptable	Results within method quality control specifications
Duplicate Sample Analysis	Acceptable	Results within method quality control specifications
Spike Sample Analysis	Acceptable	Results within method quality control specifications
Post-Spike Sample Analysis	Acceptable	Results within method quality control specifications
Serial Dilution Sample Analysis	Acceptable	Results within method quality control specifications
Internal Standards	Acceptable	Results were within quality control limits.
Raw Data Review	Acceptable	No anomalies were noted in the data
Equipment Blank	Acceptable	Contaminants of interest were not detected above the RDL

Data Verification

Project: Schlumberger – Twelve Mile Creek Monitoring Wells Collected: September 2012

Work Orders: 2090581 and 2090626

Metals		
Metals – ICP-MS EPA 6020A		
Requirement	**Evaluation**	**Comments**
Instrument Tuning	Acceptable	Results within method quality control specifications
Initial Calibration	Acceptable	Results within method quality control specifications
Initial Calibration Verification	Acceptable	Results within method quality control specifications
Continuing Calibration Verification	Acceptable	Results within method quality control specifications
Blanks	Acceptable	Initial calibration blank, continuing calibration blank, and batch blank results were less than the RDL
Interference Check Standard	Acceptable	Results within method quality control specifications
Laboratory Control Sample	Acceptable	Results within method quality control specifications
Duplicate Sample Analysis	Acceptable	Results within method quality control specifications
Spike Sample Analysis	Acceptable	Results within method quality control specifications
Post-Spike Sample Analysis	Acceptable	Results within method quality control specifications
Serial Dilution Sample Analysis	Acceptable	Results within method quality control specifications
Internal Standards	Acceptable	Results were within quality control limits.
Raw Data Review	Acceptable	No anomalies were noted in the data
Equipment Blank	Acceptable	Contaminants of interest were not detected above the RDL

Data Verification

Project: Schlumberger – Twelve Mile Creek Monitoring Wells Collected: September 2012

Work Orders: 2090581 and 2090626

Organics		
PCBs EPA 8082		
Requirement	**Evaluation**	**Comments**
Initial Calibration	Acceptable	Results within method quality control specifications
Initial Calibration Verification	Acceptable	Results within method quality control specifications
Continuing Calibration Verification	Acceptable	Results within method quality control specifications
Blanks	Acceptable	Initial calibration blank, continuing calibration blank, and batch blank results were less than the RDL
Laboratory Control Sample	Acceptable	Results within method quality control specifications
Duplicate Sample Analysis	Acceptable	Results within method quality control specifications
Spike Sample Analysis	Acceptable	Results within method quality control specifications
Surrogates	Acceptable	Results within method quality control specifications except for sample 2090626-07
Raw Data Review	Acceptable	No anomalies were noted in the data.
Equipment Blanks	Acceptable	Contaminants of interest were not detected above the RDL

General		
Requirement	**Evaluation**	**Comments**
Preservation	Acceptable	Samples were properly preserved in the field
Holding Time	Acceptable	Samples were analyzed within holding time

Data Verification

Project: Schlumberger – Twelve Mile Creek Monitoring Wells Collected: September 2012

Work Orders: 2090581 and 2090626

Case Narrative

Samples were collected on 9/19/12 and 9/20/12 by Rogers and Callcott field personnel. The samples were received in the laboratory on 9/20/12 for metals and PCB analysis.

The analytical and sample preparation methods were performed to meet or exceed the quality control requirements of the method.

PCB – EPA 8082A

Sample 2090626-07 (MW-4) - the surrogate Decachlorobiphenyl recovered 20 % which is out of the quality control limits. The sample was re-extracted and re-analyzed. The surrogate recovery was confirmed. The low surrogate recovery is judged to be matrix related.

Method blank for 9/26/12 extraction batch = the surrogate Decachlorobipheny was not within quality control limits. This surrogate was within control limits for the LCS and sample in this extraction batch.

Data Validator: Melissa Rem Date: 11/2/12

APPENDIX C

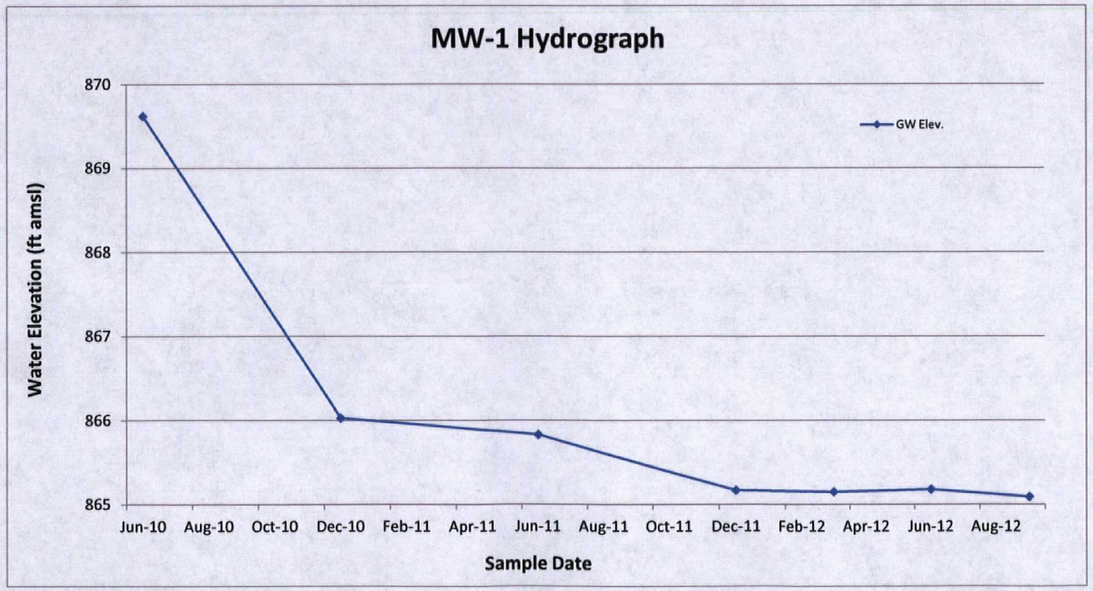
GROUNDWATER DATABASE

TWELVEMILE CREEK SMU
Pickens County, South Carolina
Schlumberger Technology Corporation

MW-1
Measuring Pt. Elev.= 931.35 ft amsl

Date	Depth to Water (ft. BTOC)	Water Elev. (ft. msl)	pH (SU)	ORP (mv)	Specific Conductivity (umhos/cm)	Temp. (C)	Turbidity (ntu)	Antimony (mg/l)	Arsenic (mg/l)	Barium (mg/l)	Beryllium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Copper (mg/l)	Lead (mg/l)	Nickel (mg/l)	Selenium (mg/l)	Silver (mg/l)	Thallium (mg/l)	Vanadium (mg/l)	Zinc (mg/l)	PCB 1016 (µg/l)	PCB 1221 (µg/l)	PCB 1232 (µg/l)	PCB 1242 (µg/l)	PCB 1248 (µg/l)	PCB 1254 (µg/l)	PCB 1260 (µg/l)
Jun-10	61.73	869.62	6.0	112	75	24.6	8.8	< 0.005	< 0.005	**0.02**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	**0.03**	< 0.05	< 0.02	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-10	65.32	866.03	6.2	183	107	13.0	< 5.0	< 0.005	< 0.005	**0.02**	< 0.004	< 0.005	< 0.02	**0.01**	< 0.01	< 0.002	**0.11**	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-11	65.52	865.83	6.4	180	103	22.7	< 5.0	< 0.005	< 0.005	**0.05**	< 0.004	< 0.005	< 0.02	**0.01**	< 0.01	< 0.002	**0.06**	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-11	66.18	865.17	7.3	82	162	14.4	< 5.0	< 0.005	< 0.005	**0.01**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mar-12	66.20	865.15	7.0	58.4	159	15.5	< 5.0	< 0.005	< 0.005	**0.021**	< 0.004	< 0.004	< 0.020	< 0.010	< 0.010	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-12	66.17	865.18	7.0	9.8	158	24.4	< 5.0	< 0.005	< 0.005	**0.022**	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	**0.021**	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sep-12	66.26	865.09	7.0	24.2	162	21.2	6.2	< 0.005	< 0.005	**0.041**	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	**0.046**	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MCL*	--	--	**NE**	**NE**	**NE**	**NE**	**NE**	**0.006**	**0.010**	**2.0**	**0.004**	**0.005**	**0.1**	**NE**	**1.3[1]/1.0[2]**	**0.015[1]**	**NE**	**0.05**	**0.1[2]**	**0.002**	**NE**	**5[2]**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**

*MCL = EPA's Drinking Water Maximum Contaminant Level (NE = Not Established)
[1] Action Level for drinking water systems requiring corrosion control.
[2] Secondary MCL

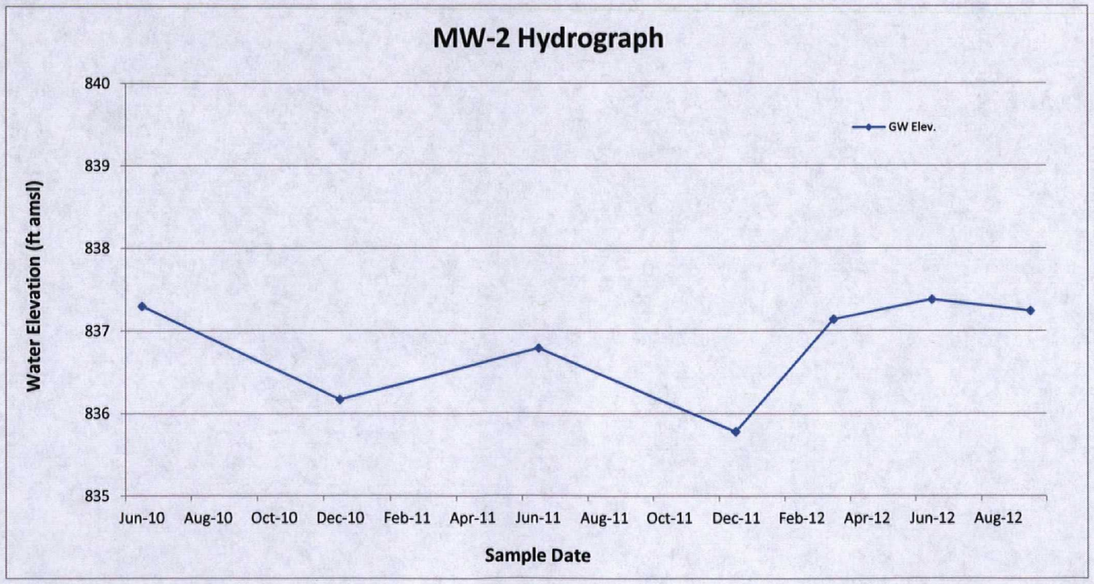


TWELVEMILE CREEK SMU
Pickens County, South Carolina
Schlumberger Technology Corporation

MW-2
Measuring Pt. Elev. = 893.71 ft amsl

Date	Depth to Water (ft. BTOC)	Water Elev. (ft. msl)	pH (SU)	ORP (mv)	Specific Conductivity (umhos/cm)	Temp. (C)	Turbidity (ntu)	Antimony (mg/l)	Arsenic (mg/l)	Barium (mg/l)	Beryllium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Copper (mg/l)	Lead (mg/l)	Nickel (mg/l)	Selenium (mg/l)	Silver (mg/l)	Thallium (mg/l)	Vanadium (mg/l)	Zinc (mg/l)	PCB 1016 (µg/l)	PCB 1221 (µg/l)	PCB 1232 (µg/l)	PCB 1242 (µg/l)	PCB 1248 (µg/l)	PCB 1254 (µg/l)	PCB 1260 (µg/l)
Jun-10	56.41	837.30	6.2	36	873	20.0	< 5.0	< 0.005	< 0.005	**0.03**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.02	< 0.002	< 0.01	< 0.05	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dec-10	57.54	836.17	6.9	-3.4	577	17.8	10	< 0.005	< 0.005	**0.01**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-11	56.92	836.79	6.6	-11	313	23.1	39	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-11	57.93	835.78	7.1	-58	264	13.9	6.9	< 0.005	< 0.005	**0.01**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mar-12	56.57	837.14	6.6	-40	337	17.6	11.7	< 0.005	< 0.005	**0.019**	< 0.004	< 0.004	< 0.020	< 0.010	< 0.010	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-12	56.33	837.38	6.6	-34.3	220	18.5	5.7	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	< 0.010	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sep-12	56.47	837.24	6.5	-39.6	197	17.5	6.9	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MCL*	--	--	NE	NE	NE	NE	NE	0.006	0.010	2.0	0.004	0.005	0.1	NE	1.3[1]/1.0[2]	0.015[1]	NE	0.05	0.1[2]	0.002	NE	5[2]	0.5	0.5	0.5	0.5	0.5	0.5	0.5

*MCL = EPA's Drinking Water Maximum Contaminant Level (NE = Not Established)
[1] Action Level for drinking water systems requiring corrosion control.
[2] Secondary MCL

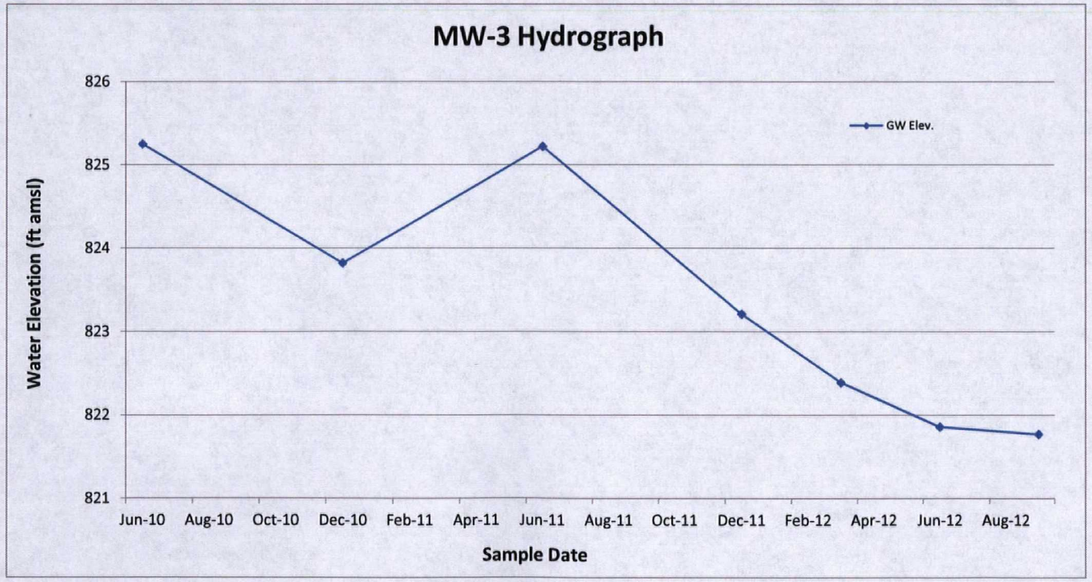


TWELVEMILE CREEK SMU
Pickens County, South Carolina
Schlumberger Technology Corporation

MW-3
Measuring Pt. Elev. = 893.10 ft amsl

Date	Depth to Water (ft. BTOC)	Water Elev. (ft. msl)	pH (SU)	ORP (mv)	Specific Conductivity (umhos/cm)	Temp. (C)	Turbidity (ntu)	Antimony (mg/l)	Arsenic (mg/l)	Barium (mg/l)	Beryllium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Copper (mg/l)	Lead (mg/l)	Nickel (mg/l)	Selenium (mg/l)	Silver (mg/l)	Thallium (mg/l)	Vanadium (mg/l)	Zinc (mg/l)	PCB 1016 (µg/l)	PCB 1221 (µg/l)	PCB 1232 (µg/l)	PCB 1242 (µg/l)	PCB 1248 (µg/l)	PCB 1254 (µg/l)	PCB 1260 (µg/l)
Jun-10	67.85	825.25	6.5	150	122	21.4	6.6	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	**0.03**	< 0.05	< 0.02	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-10	69.28	823.82	6.8	104	109	16.8	6.4	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-11	67.88	825.22	6.8	144	119	21.1	11	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-11	69.89	823.21	7.1	61	124	13.7	7.6	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mar-12	70.71	822.39	6.9	106	118	19.7	15.7	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.020	< 0.010	< 0.010	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-12	71.24	821.86	6.6	112	95.1	26.4	< 5.0	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	< 0.010	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sep-12	71.33	821.77	6.5	-11.6	105	16.5	7.0	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MCL*	--	--	**NE**	**NE**	**NE**	**NE**	**NE**	**0.006**	**0.010**	**2.0**	**0.004**	**0.005**	**0.1**	**NE**	**1.3[1]/1.0[2]**	**0.015[1]**	**NE**	**0.05**	**0.1[2]**	**0.002**	**NE**	**5[2]**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**

*MCL = EPA's Drinking Water Maximum Contaminant Level (NE = Not Established)
[1] Action Level for drinking water systems requiring corrosion control.
[2] Secondary MCL

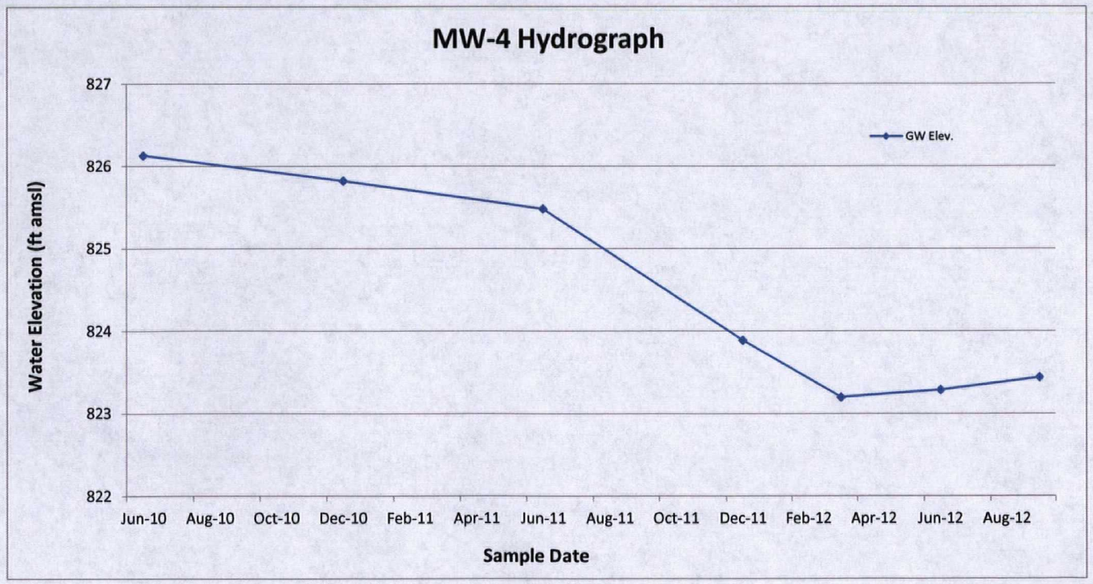


TWELVEMILE CREEK SMU
Pickens County, South Carolina
Schlumberger Technology Corporation

MW-4
Measuring Pt. Elev. = 904.30 ft amsl

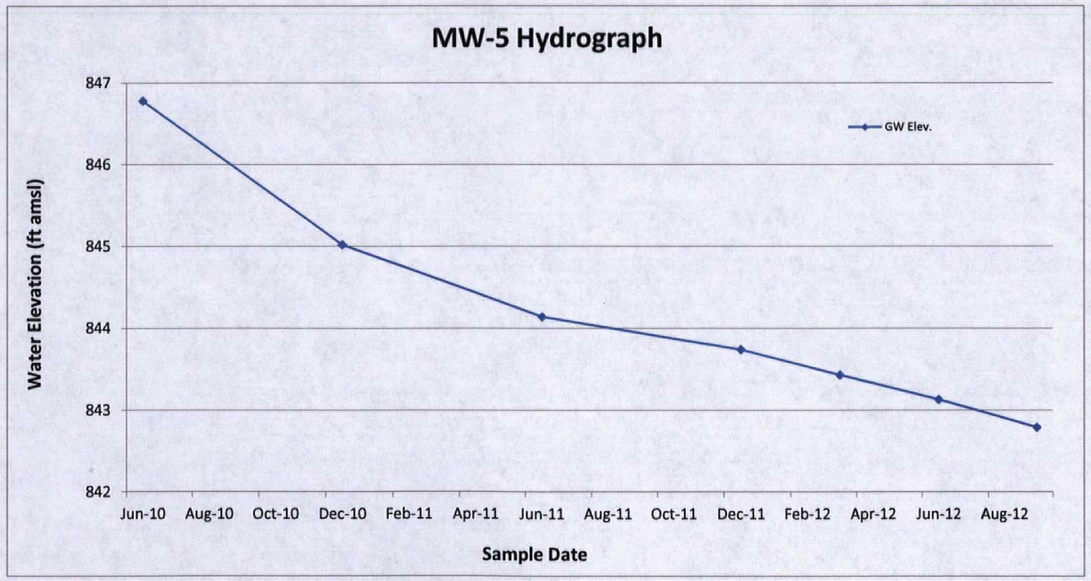
Date	Depth to Water (ft. BTOC)	Water Elev. (ft. msl)	pH (SU)	ORP (mv)	Specific Conductivity (umhos/cm)	Temp. (C)	Turbidity (ntu)	Antimony (mg/l)	Arsenic (mg/l)	Barium (mg/l)	Beryllium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Copper (mg/l)	Lead (mg/l)	Nickel (mg/l)	Selenium (mg/l)	Silver (mg/l)	Thallium (mg/l)	Vanadium (mg/l)	Zinc (mg/l)	PCB 1016 (µg/l)	PCB 1221 (µg/l)	PCB 1232 (µg/l)	PCB 1242 (µg/l)	PCB 1248 (µg/l)	PCB 1254 (µg/l)	PCB 1260 (µg/l)
Jun-10	78.17	826.13	5.4	336	22	20.4	9.0	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.02	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-10	78.48	825.82	5.6	239	22	14.2	< 5.0	< 0.005	< 0.005	< 0.01	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-11	78.82	825.48	5.6	269	26	20.3	145	< 0.005	**0.008**	**0.03**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	**0.003**	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-11	80.41	823.89	5.7	234	23	13.5	46	< 0.005	< 0.005	**0.01**	< 0.004	< 0.005	< 0.02	< 0.01	< 0.01	< 0.002	< 0.02	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mar-12	81.10	823.20	5.5	263	21.6	21.4	9.1	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.020	< 0.010	< 0.010	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-12	81.01	823.29	5.5	117	20.5	18.7	< 5.0	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	< 0.010	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sep-12	80.86	823.44	5.5	152	21.1	17.6	6.0	< 0.005	< 0.005	< 0.010	< 0.004	< 0.004	< 0.010	< 0.010	< 0.004	< 0.002	< 0.020	< 0.050	< 0.010	< 0.002	< 0.010	< 0.010	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MCL*	--	--	**NE**	**NE**	**NE**	**NE**	**NE**	**0.006**	**0.010**	**2.0**	**0.004**	**0.005**	**0.1**	**NE**	**1.3[1]/1.0[2]**	**0.015[1]**	**NE**	**0.05**	**0.1[2]**	**0.002**	**NE**	**5[2]**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**

*MCL = EPA's Drinking Water Maximum Contaminant Level (NE = Not Established)
[1] Action Level for drinking water systems requiring corrosion control.
[2] Secondary MCL



TWELVEMILE CREEK SMU
Pickens County, South Carolina
Schlumberger Technology Corporation

MW-5
Measuring Pt. Elev. = 906.94 ft amsl

Date	Depth to Water (ft. BTOC)	Water Elev. (ft. msl)	pH (SU)	ORP (mv)	Specific Conductivity (umhos/cm)	Temp. (C)	Turbidity (ntu)	Antimony (mg/l)	Arsenic (mg/l)	Barium (mg/l)	Beryllium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Cobalt (mg/l)	Copper (mg/l)	Lead (mg/l)	Nickel (mg/l)	Selenium (mg/l)	Silver (mg/l)	Thallium (mg/l)	Vanadium (mg/l)	Zinc (mg/l)	PCB 1016 (µg/l)	PCB 1221 (µg/l)	PCB 1232 (µg/l)	PCB 1242 (µg/l)	PCB 1248 (µg/l)	PCB 1254 (µg/l)	PCB 1260 (µg/l)
Jun-10	60.16	846.78	5.3	301	154	23.9	< 5.0	< 0.005	< 0.005	**0.06**	< 0.004	< 0.005	< 0.02	**0.09**	< 0.01	< 0.002	**0.19**	< 0.05	< 0.02	< 0.002	< 0.01	**0.08**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-10	61.92	845.02	5.4	286	170	12.6	7.7	< 0.005	< 0.005	**0.05**	< 0.004	< 0.005	< 0.02	**0.05**	< 0.01	< 0.002	**0.08**	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-11	62.80	844.14	5.5	248	163	19.0	8.0	< 0.005	< 0.005	**0.04**	< 0.004	< 0.005	< 0.02	**0.05**	< 0.01	< 0.002	**0.09**	< 0.05	< 0.01	< 0.002	< 0.01	**0.05**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dec-11	63.20	843.74	5.5	242	175	14.7	13	< 0.005	< 0.005	**0.04**	< 0.004	< 0.005	< 0.02	**0.04**	< 0.01	< 0.002	**0.08**	< 0.05	< 0.01	< 0.002	< 0.01	< 0.05	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mar-12	63.51	843.43	5.3	249	123	22.9	20.7	< 0.005	< 0.005	**0.038**	< 0.004	< 0.004	< 0.020	**0.029**	< 0.010	< 0.002	**0.067**	< 0.050	< 0.010	< 0.002	< 0.010	< 0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Jun-12	63.81	843.13	5.3	182	136	23.7	6.7	< 0.005	< 0.005	**0.038**	< 0.004	< 0.004	< 0.010	**0.038**	**0.006**	< 0.002	**0.086**	< 0.050	< 0.010	< 0.002	< 0.010	**0.057**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Sep-12	64.15	842.79	5.3	161	196	18.3	11.4	< 0.005	< 0.005	**0.045**	< 0.004	< 0.004	< 0.010	**0.036**	**0.004**	< 0.002	**0.074**	< 0.050	< 0.010	< 0.002	< 0.010	**0.044**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MCL*	--	--	NE	NE	NE	NE	NE	0.006	0.010	2.0	0.004	0.005	0.1	NE	1.3[1]/1.0[2]	0.015[1]	NE	0.05	0.1[2]	0.002	NE	5[2]	0.5	0.5	0.5	0.5	0.5	0.5	0.5

*MCL = EPA's Drinking Water Maximum Contaminant Level (NE = Not Established)
[1] Action Level for drinking water systems requiring corrosion control.
[2] Secondary MCL