SEMI-ANNUAL GROUNDWATERMONITORING REPORT

ENVIRONMENTAL WASTE SOLUTIONS
CAMDEN CLASS II LANDFILL
TDSWM PERMIT NUMBER IDL 03-0212
CAMDEN, TENNESSEE

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CEC Project 101-301

FEBRUARY 2014

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December 2013

Environmental Waste Solutions Camden Class II Landfill
TDSWM Permit Number IDL 03-0212
Camden, Tennessee

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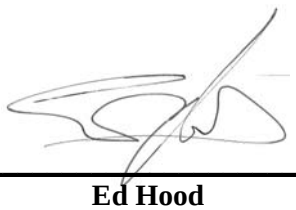

Ed Hood
Principal

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EXECUTIVE SUMMARY

This report documents the second semi-annual monitoring event of 2013 for the Environmental Waste Solutions, LLC (EWS) Class II Landfill. The Class II landfill is registered with the Tennessee Division of Solid Waste Management (TDSWM) with permit number IDL 03-0212. The EWS Camden Class II Landfill is located in Benton County at 200 Omar Circle, Camden, Tennessee (latitude 36°03'16" N/ longitude 88°05'16" W).

The following table presents the wells that were used to develop this report.

Upgradient Monitoring Point	Downgradient Monitoring Points
MW-1	MW-3, MW-4

Groundwater samples were collected by Civil & Environmental Consultants, Inc. (CEC) on December 23, 2014. ESC Lab Sciences performed the analysis and reported the results on January 7, 2014. All monitoring wells were sampled during the event, with the exception of MW-2, which was recently replaced by MW-4. MW-2 has subsequently been removed from the monitoring network because the well routinely yielded insufficient volume of water for sampling purposes. MW-2 remains in place, and will continue to be monitored for field parameters and water level data. The collected groundwater samples were analyzed for Appendix I inorganics, Chloride, Nitrate, Sulfate, Ammonia (NH3), Boron, and a short list of ions.

Since additional waste streams have been approved for disposal in the EWS Class II Landfill, the TDSWM requested that EWS add the volatile organic compounds (VOCs) included in the Appendix I Constituents For Groundwater Monitoring presented in Rule 0400-11-01-.04 (9.) d of the Rules and Regulations Governing Solid Waste Disposal in Tennessee to the existing groundwater constituents.

Inter-well prediction interval analysis was used to identify statistically significant increases (SSIs) over background concentrations for the analyzed water quality parameters. The percentage of inter-well background non-detects for each parameter determines the primary statistical method utilized for each parameter. If the percentage of non-detects in the background samples is less than 50%, Shewart-CUSUM control charts are utilized. If more than 50% background non-detects exist for the given parameter, non-parametric inter-well prediction limit analysis is conducted on the data. Only parameters reported above the detection limits of the laboratory were evaluated. The results of the analysis are summarized as follows:

- SSIs over background identified for the current monitoring event include barium at MW-3 and chloride at MW-3 and MW-4. This is consistent with historical data for MW-3.

The next semi-annual monitoring event is tentatively scheduled for May, 2014.

Glossary of Terms

Appendix I – Refers to the required regulatory sample list of groundwater parameters
CEC – Civil & Environmental Consultants, Inc.
Class I Landfill – Municipal Solid Waste Landfill accepts household waste
Class II Landfill – Industrial Waste Landfill
Class IV Landfill – Construction/Demolition Waste Landfill
Class III/IV Landfill – Landscaping and Construction/Demolition Waste Landfill
DML – Construction Demolition Landfill
EPA – Environmental Protection Agency
ESC – ESC Lab Sciences
EWS – Environmental Waste Solutions
GW – Groundwater
HDPE – High Density Polyethylene
HE – House Engineering LLC
HI – Hydrogeologic Investigation
MCL – Maximum Contaminant Level
µS•cm-1 - micro-Siemens per centimeter
mg/L – milligrams per Liter
MW – Monitor Well
NPPL - Non-parametric prediction limit analysis
ORP – Oxidation Reduction Potential
POTW – Publically Operated Treatment Works
ppm – parts per million*
PQL – Practical Quantitation Limit
QC – Quality Control
SNL – Sanitary Landfill
TDEC – Tennessee Department of Environment and Conservation
TDOG – Tennessee Division of Geology
TDSWM – Tennessee Division of Solid Waste Management
TOC – Top of Casing
VOC – Volatile Organic Compound

* ppm – parts per million* is equivalent to mg/L – milligrams per Liter

1.0 INTRODUCTION

1.1 SITE LOCATION

EWS, LLC. manages the Camden Class II landfill located just off highway US 70 at 200 Omar Circle, Camden, Tennessee. The site can be located on the Camden, Tennessee USGS quadrangle at north latitude 36o 3' 16" and west longitude 88o 05' 16" at an average elevation of 400 feet above mean sea level datum (MSL). The location of the facility is indicated in Figure 1- Site location Map. The landfill footprint can be viewed in Figure 2 - Potentiometric Surface Map.

1.2 CURRENT ACTIVITIES

The EWS Camden Class II Landfill currently receives secondary aluminum smelter waste for disposal including aluminum dross and salt cakes and other industrial wastes approved by the TDSWM.

2.0 AQUIFER CHARACTERISTICS

2.1 GEOLOGIC AND AQUIFER CHARACTERISTICS

The extensive reworking of the site as a result of the excavation of chert for local road and fill projects has significantly impacted the original site geology. Based upon a review of the Tennessee Division of Geology (TDOG) Geologic Map and site observations it appears that the site is within the Camden and Harriman Formations. It is reported by the TDOG that the Camden and Harriman Formations are lithologically identical, and not enough fossils are present to form a convenient basis for subdivision.

2.1.1 Camden and Harriman Formations

The Camden and Harriman Formations are described as follows: Chert, gray with specks and mottlings of very light-gray and yellowish-gray (surfaces stained pale to dark yellowish-orange), bedded and blocky (beds 2 to 8 inches thick), dense, conchoidal fracture, contains pods of white to light gray tripolitic clay, locally stained yellow and brown, fossiliferous. Locally, especially near the top, fragments of chert are cemented into large masses and beds of breccia by dark-brown to moderate-red limonite.

Groundwater potentiometric data collected from the uppermost water bearing zone across the entire proposed waste area footprint during the 1999 and 2006 hydrogeological investigations indicate that the uppermost aquifer is sloped to the southwest. Comparisons of the water bearing zone elevations to static groundwater elevations for both indicate an unconfined aquifer.

2.2 MONITOR WELL INTEGRITY & STATIC WATER LEVELS

The groundwater monitoring network for the Class II Landfill consists of monitor wells MW-1, MW-3, and MW-4. Monitor well MW-1 serves as an up-gradient monitoring point while monitor wells MW-3 and MW-4 serve as down-gradient monitoring points.

The integrity of each monitor well is checked during each sampling event prior to groundwater collection. The physical condition of each wellhead is observed and noted along with the condition and ability of any and all locking mechanisms for each monitor well. Once the watertight seal is removed from the top of each monitor well's casing, the well is allowed to de-pressurize. A decontaminated electronic probe is slowly lowered into the monitor well to establish the distance between the established top of casing and the elevation of free groundwater. The distance is then re-checked to ensure that the measurement is of actual static water level and the groundwater is not rising or falling in the monitor well. The electronic probe is capable of determining this distance to within one, one-hundredth of one foot (0.01 foot). This distance is written in the site-specific field book as depth-to-water. Upon collection of this data, the electronic water level probe is removed from the monitor well and decontaminated from contact with the well casing / screen and groundwater.

The following equation is used to determine the elevation of groundwater at each well:
Established Top of Casing Elevation – Depth to Water = Groundwater Elevation

Top of casing elevation has been determined by a licensed land surveyor and is referenced to Mean Sea Level Datum of the World Geodetic Survey of 1984. Groundwater elevations are listed in **Table 1 - Field Parameters & Potentiometric Data, Appendix A**.

2.3 GROUNDWATER FLOW DIRECTION

Groundwater flow at the landfill appears to flow in a southwesterly direction towards Charlie Creek. Groundwater flow in the vicinity of the Class II Landfill appears to flow from a topographic high north, northeast of the landfill toward the southwest where monitor wells MW-3and MW-4 are positioned to intercept any possible groundwater contaminants leaching from the landfill.

2.4 POTENTIOMETRIC GRADIENT

The Potentiometric surface of the first aquifer occurring beneath the Class II Landfill occurs at approximately twenty-one (21) feet below ground surface at the up-gradient monitor well MW-1 to approximately ten (10) feet below ground surface at monitor well MW-4. The groundwater potentiometric data interpreted from the 1999 and 2006 hydrogeological investigations conducted at the site for the uppermost aquifer indicate that the uppermost water bearing zone is sloped to the southwest. Comparisons of water bearing zone elevations to static groundwater elevations for both investigations indicate an unconfined aquifer. The potentiometric gradient calculated from groundwater elevation data collected on December 23, 2013 is approximately 1.24 % slope.

The potentiometric gradient is calculated according to the following formula:

$$\frac{\text{Highest GW. Elev. – Lowest GW. Elev.}}{\text{Horizontal Distance Between the Potentiometric Contours}} * 100 = \text{Pot. Grad.}$$

$$\frac{(394.00 \text{ at MW-1}) - (371.71 \text{at MW-2})}{1{,}800'} * 100 = 1.24\%$$

The above calculation assumes a perpendicular gradient between the potentiometric contours drawn between MW-1 to MW-4. These assumptions may provide an artificially higher potentiometric gradient than is likely occurring at the site.

2.5 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity estimations within the first aquifer occurring beneath either landfill have not been determined at this time.

3.0 GROUNDWATER SAMPLING PROCEDURES

3.1 INSTRUMENTATION

Depth to groundwater measurements are collected using a Solinst® electronic water level indicator, model # 122. A YSI 556 Multi-parameter probe is used to record pH, specific conductance, temperature, dissolved oxygen and ORP during groundwater sampling events at the landfill. A LaMotte model 2020 turbidity meter or equivalent is used to collect turbidity readings. Each instrument is either checked against known standards or calibrated as per manufacturers' specifications prior to the commencement of sampling activities.

3.2 PURGING AND COLLECTION OF FIELD PARAMETER VALUES

The total volume of groundwater residing in each monitor well is calculated by subtracting the depth to water from the total depth of each well. This linear distance is next multiplied by 0.163 gallons per foot in a 2 inch (I.D.) monitor well. For purging, a disposable polyethylene bailer with sufficient nylon twine is slowly lowered into the water column. The bailer is allowed to completely submerse into the water column prior to extracting the bailer from the monitor well. The first bailer of purged groundwater is collected in a clean, high-density polyethylene (HDPE) reservoir where it is observed for Temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction potential (ORP) and turbidity. These values are noted in the site specific field book as V_0 and then the collected groundwater is discarded onto the ground, away from the monitor well. Groundwater shall be purged using either a decontaminated down-well pump using new tubing or using new tubing connected to a peristaltic pump or in the case of a pump malfunction, a new disposable bailer.

Normally, bailers are not used at the EWS Camden Class II Landfill. However, if bailers are used due to pump malfunction, bailers shall be constructed of either polyethylene or Teflon. Bailers shall be factory decontaminated and sealed as to allow no environmental contaminants to interact with the bailer. New nylon twine shall be fixed to each bailer via a tied knot.

The collected groundwater will be decanted into a flow-through cell where it will be observed for pH, specific conductance, temperature, and turbidity. These values will be noted in the site specific field book as V_0 and then the collected groundwater will be poured onto the ground, down-gradient from the monitor well.

Groundwater shall be purged from the monitor well for a specific period of time that allows for a new volume of water to have passed into the flow-through cell. Once this volume of water has been purged, the field chemistry parameters will again be observed and recorded in the field book as V_1. This procedure for purging groundwater continues for an additional well volume, if sufficient groundwater is available. After the second purged well volume has been observed for field parameter values, the values are checked against values for V_1. If the pH and specific conductance values for each volume purged vary no more than 10% from V_1 to V_2 and the temperature has stabilized to within one degree Celsius, preparations are made to collect a groundwater sample for submittal to an analytical laboratory. If the field parameters have not stabilized, the purging procedure shall continue until either one of the following conditions are met:

1. Field stabilization occurs,
2. Well is purged dry, or
3. Five well volumes have been purged.

If the monitor well is purged dry, then the recharging groundwater shall be collected within twenty-four hours.

Field parameter values are presented in Table 1 – Groundwater Field Data, Appendix A. A detailed account of each purge and sample procedure conducted at each monitor well is presented in Appendix B.

3.3 SAMPLE COLLECTION & PRESERVATION

Groundwater samples are collected from monitor wells once field parameter data indicates that stagnant water has been purged from the well. Groundwater is placed in laboratory supplied sample vessels in the following order if analyzed: Appendix I inorganics – one (1), five-hundred (500) ml preserved with nitric (HNO3) acid; Chloride, Nitrate, Sulfate – one (1), two-hundred fifty (250) ml unpreserved HDPE jar; Ammonia – one (1), two-hundred fifty (250) ml HDPE jar preserved with sulfuric (H2SO4) acid.

3.4 QUALITY ASSURANCE & QUALITY CONTROL

Field blanks were collected for each sample collection event performed to date at the EWS Class II Landfill. CEC collected a field blank next to monitoring well MW-3. The field blanks were collected by pouring deionized water into a duplicate set of sample bottles. Thereby, allowing

any airborne contaminants a chance to enter the field blank sample. Laboratory analytical testing of the field blanks did not reveal the presence of any of the EWS Class II Landfill site specific target compounds.

In addition, a duplicate sample was collected from MW-4 for laboratory quality control purposes. The reported values for the duplicate sample are similar to the original MW-4 sample with the exception of Lead. Lead was detected at a concentration of 0.0014 mg/L in the original sample from MW-4 and no detection above the detection limit in the duplicate from MW-4.

3.5 SAMPLE CHAIN-OF-CUSTODY

A sample Chain-of-Custody (COC) traveled along with each sample kit from ESC to EWS and finally back to ESC for the sampling events. The CEC SOP for Chain of Custody 07-01-01 may be found in **Appendix D**.

4.0 LABORATORY ANALYTICAL PROCEDURES

4.1 ANALYTICAL METHODS

All laboratory analyses for the December 2013 monitoring event were completed by Environmental Science Corporation in Mt. Juliet, Tennessee. The analytical methods chosen for this monitoring event are the most appropriate procedures as directed by the Tennessee Division of Solid Waste Management (TN-DSWM) and the United States Environmental Protection Agency's publication SW-846, entitled Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (3rd Edition).

The SW-846 methods used for the analysis of groundwater (if necessary) were as follows:

Method 6010b	Inductively Coupled Plasma (ICP) – Atomic Emission Spectrometry
Method 6020	ICP – Mass Spectrometry
Method 7470A	Mercury in Liquid Waste – Manual Cold Vapor Technique
Method 8011	1,2-dibromoethane & 1,2 dibromo-3-chloropropane by Micro-extraction and Gas Chromatography
Method 8260B	Volatile Organic Compounds by Gas Chromatograph / Mass Spectrometry
Method 9056	Determination of Inorganic Anions by Ion Chromatography (Fluoride)
Method 350.1	Ammonia Nitrogen

4.2 LABORATORY ANALYTICAL RESULTS

Laboratory reports from the analysis of groundwater samples collected from the EWS Camden Class II Landfill during the semi-annual monitoring event were prepared by ESC and reported to CEC on January 7, 2014. Copies of the laboratory reports are located in **Appendix C – Laboratory Analytical Reports**. Constituent values from all laboratory analysis along with applicable maximum contaminant levels (MCLs) are presented in **Table 2 – Analytical Results, Appendix A.**

4.3 QUALITY CONTROL QUALIFIER CODES

The EPA Contract Laboratory Program states that sample and result qualifiers should be utilized as part of a total quality control process. ESC complies with this directive and reports all qualifiers along with explanations of QC qualifier codes. One QC qualifier code was indicated during the laboratory analysis of groundwater samples during this monitoring event and can be viewed along with the **Laboratory Analytical Reports, Appendix C**.

5.0 STATISTICAL ANALYSIS

5.1 APPLICABLE METHODS

The Rules of Tennessee Department of Environment and Conservation, Division of Solid Waste Management Chapter 1200-1-7-.04 states, in part, that each landfill must conduct and report statistical analysis as part of the evaluation of groundwater monitoring data. Several methods may be employed for this endeavor. EWS Camden Class II Landfill has chosen to use Inter-well and intra-well non-parametric prediction limit analysis (NPPL) at this time.

First, the distribution of the data was evaluated for normality. Data determined to be normally distributed were evaluated using parametric prediction interval analysis. Data that was not normally distributed were evaluated using non-parametric statistical methods. Inter-well and intra-well parametric and non-parametric prediction limit analyses (NPPL) were deemed appropriate for this data set. Inter-well analyses compared the concentrations observed at the down-gradient monitoring locations to the concentrations observed at the up-gradient monitoring location during this monitoring event. For the Class II Landfill, monitor well MW-1 was considered as background. Intra-well analysis was also utilized at MW-1 to compare the concentrations observed during the current groundwater sampling event to the established background data set.

The percentage of inter-well background non-detects for each parameter determines the primary statistical method utilized for each parameter. If the percentage of non-detects in the background samples is less than 50%, Shewart-CUSUM control charts are utilized. If more than 50% background non-detects exist for the given parameter, non-parametric inter-well prediction limit analysis is conducted on the data.

The computer program ChemStat was used for all statistical computations. Worksheets indicating inter-well and intra-well statistical analysis sheets and time versus concentration charts may be viewed in **Appendix B, Statistical and Trend Analysis**.

5.2 RESULTS

Review of the statistical analysis performed on the available data indicated that there were two statistically significant increases (SSI's) over background data. The SSI's over background data

were limited to Barium (MW-3), and Chloride (MW-3 and MW-4). The Barium and Chloride detections observed at MW-3 and MW-4 are well below their associated MCL's.

Trend analysis utilizing the limited data available from the monitoring events showed no distinct trends for the site monitoring wells.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Representative groundwater samples were collected from monitor wells MW-1, MW-3 and MW-4. The groundwater samples were analyzed for Appendix I list of parameters, chloride, nitrate, sulfate, ammonia (NH_3). Additionally, a short list of ions including Aluminum, Boron, Calcium, Iron, Magnesium, Manganese, Potassium, and Sodium were analyzed.

6.1 EWS GROUNDWATER QUALITY RELATIVE TO THE EPA PRIMARY DRINKING WATER STANDARDS

Laboratory analytical results for the groundwater samples collected from the facility monitor wells for the EWS Class II Landfill indicated that two compounds were detected at concentrations which exceeded the EPA maximum contaminant levels (MCL). Specifically, the Arsenic in MW-1 and Nitrate in MW-3 were detected above their respective maximum contaminant levels (MCL).

Arsenic was detected in MW-1 at a concentration of 0.10 mg/l. The MCL for Arsenic is 0.01 mg/l. Arsenic has been detected at concentrations exceeding the primary drinking water MCL prior to the disposal of waste in the landfill. More specifically, laboratory analytical testing of groundwater samples taken from MW-1 during background testing of the groundwater prior to waste placement in the landfill revealed concentrations of Arsenic ranging from 0.024 mg/L to 0.072 mg/L. The presence of Arsenic in the local groundwater is considered attributable to naturally occurring deposits in the soil overburden since there is no immediate development up-gradient of the well.

Nitrate was detected at MW-3 at a concentration of 12 mg/L on December 23, 2013. The MCL for Nitrate is 10 mg/L. Nitrate in the local groundwater is considered attributable to anthropogenic sources as discussed in the 2013 Initial Semi-Annual Groundwater report.

6.2 EWS GROUNDWATER QUALITY RELATIVE TO THE TENNESSEE SECONDARY DRINKING WATER STANDARDS

Laboratory analytical results for the groundwater samples collected in December of 2013 from the EWS Class II Landfill groundwater monitor well network indicated that two of the site specific groundwater monitor list of compounds was detected at concentrations which exceeded the Tennessee Public Water Supply Secondary Drinking Water Standards (2DW). Those parameters included Iron and Manganese in upgradient well MW-1, Manganese in MW-3, and Manganese in MW-4.

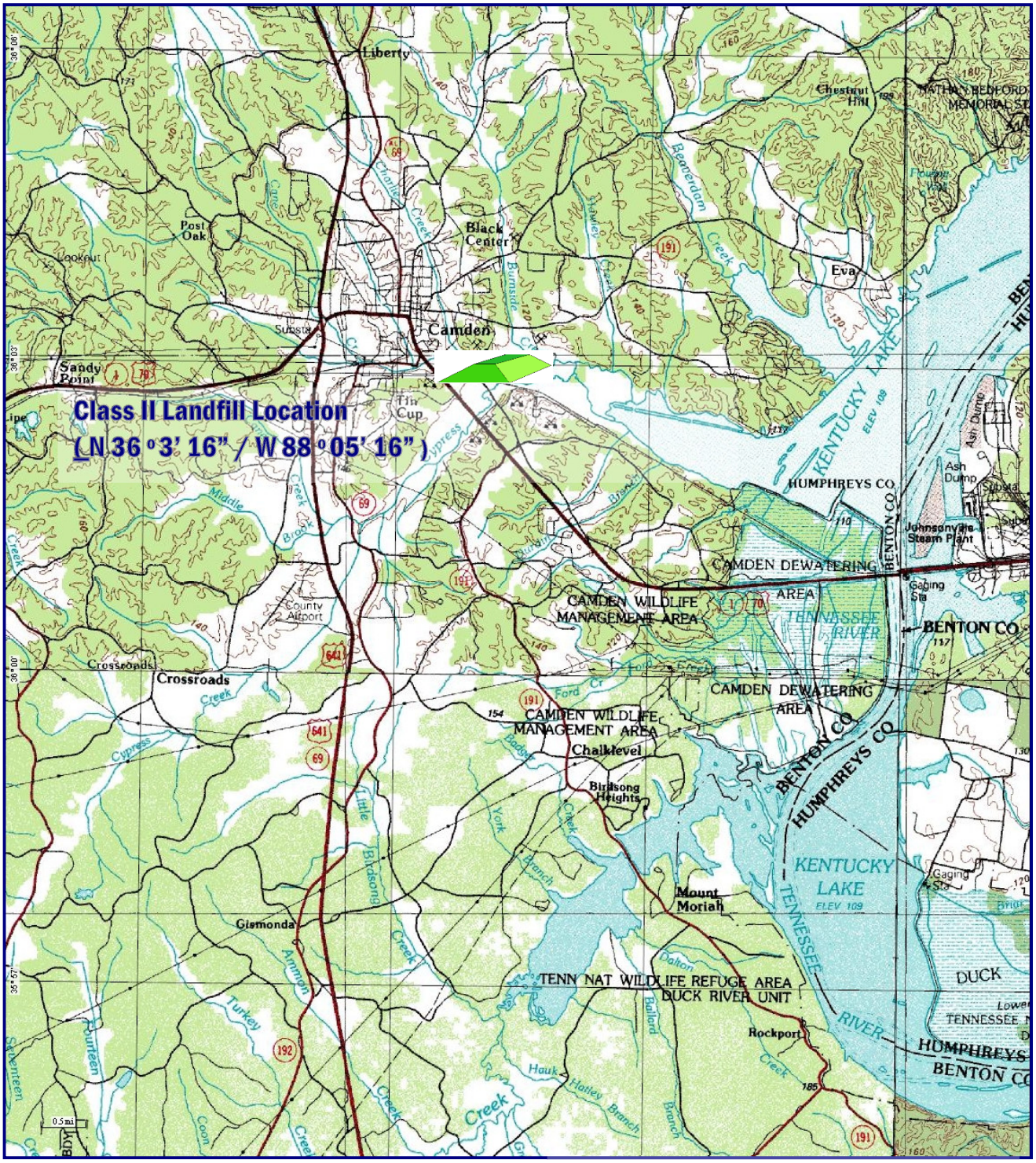
Iron was detected at a concentration of 26 mg/L in MW-1 prior to the placement of waste. Therefore, the concentration in the groundwater sample taken during the December 2013 sample event of 17 mg/L is not considered the result of a new offsite source.

Manganese has been consistently detected in upgradient well MW-1 and has the highest reported concentration observed during the current monitoring event. The manganese detections observed in site monitoring wells are considered a natural variation in local groundwater.

The next semi-annual monitoring event is tentatively scheduled for May, 2014.

APPENDIX A

MAPS AND TABLES



Source: USGS Camden Quadrangle

NORTH

FIGURE 1: SITE LOCATION MAP

CEC PROJECT 101-301	DATE 7/16/10	
	DWN. BY: JKH	
SHEET 1 OF 1	CHKD. BY: MKH	
	SCALE: Not To Scale	

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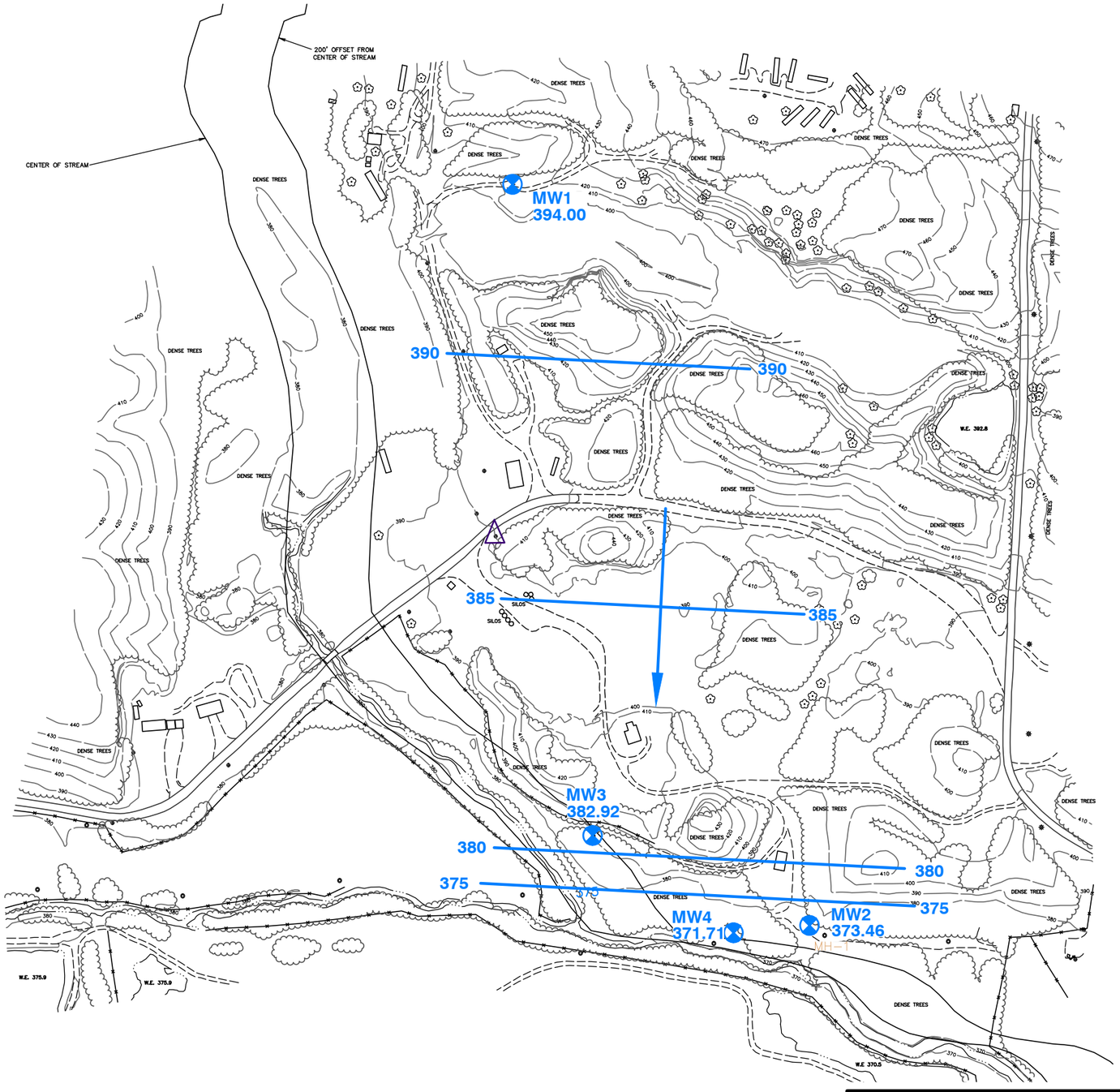

LEGEND

- MW1 / 394.00 — GROUND WATER MONITORING WELL / GROUND WATER ELEVATION (FMSL)
- 390 — POTENTIOMETRIC SURFACE CONTOUR (FMSL)
- GROUND WATER FLOW DIRECTION
- MH1 — MANHOLE

GROUNDWATER CONDITIONS

THE WATER LEVELS PRESENTED HEREIN ARE APPLICABLE TO THE LOCATION AND TIME OF MEASUREMENT. WATER LEVELS MAY FLUCTUATE THROUGH TIME.

POTENTIOMETRIC CONTOURS GENERATED FROM THIS DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF KNOWN STATIC WATER LEVEL ELEVATIONS AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. ACTUAL STATIC WATER LEVELS AT LOCATIONS BETWEEN THE MONITORING POINTS MAY DIFFER FROM THOSE DEPICTED.

SCALE IN FEET

0 300' 600'

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DECEMBER 2013
POTENTIOMETRIC SURFACE MAP

DRAWN BY:	PC	CHECKED BY:	MJ	APPROVED BY:	EH	FIGURE NO.:	2
DATE:	DECEMBER 2013	DWG SCALE:	1"=300'	PROJECT NO:	101-301		

P:\2010\101-301\-DRAFT DOCUMENTS\402013\101-301 GROUNDWATER MAP DECEMBER-2013.DWG]LAYOUT1]LS:(PCAMPBELL - 2/13/2014) - LP: 2/18/2014_11:25:03_AM

Table 1

Environmental Waste Solutions Camden Class II Landfill IDL 03-0212

Field Parameters and Potentiometric Data - December 23, 2013

Monitoring Well/ Piezometric Well	Date	Sample Time	Top of Casing Elevation Feet MSL	Purge Method	Bottom of Well Elevation Feet	Well Diameter Feet	Well Volume Gallons	Depth to Water Feet MSL	Potentiometric Surface	Temperature Degrees C	Specific Conductance micromhos/cm	pH SU	Dissolved Oxygen mg/l	Oxidation Reduction Potential Millivolts	Turbidity NTU
MW-1	12/23/2013	12:30	415.36	Bailer	382.26	0.17	2.0	21.36	394.00	16.4	121.1	6.01	1.34	5.9	31
MW-2	12/24/2013	NS	380.15	NS	367.70	0.17	1.0	6.69	373.46	11.9	290	5.88	2.41	170.9	NS
MW-3	12/25/2013	12:27	392.49	Bailer	369.66	0.17	2.3	9.57	382.92	17.20	286.7	5.75	0.19	228.5	19
MW-4	12/26/2013	13:35	381.50	Bailer	369.39	0.17	0.4	9.79	371.71	15.7	57.2	5.96	0.38	163.2	7

NS= Not Sampled, Only water level and field parameters collected at MW-2. MW-2 removed from monitoring network

Table 2

Environmental Waste Solutions Camden Class II Landfill IDL 03-0212

Analytical Data - December 23, 2013

		MW-1		MW-3		MW-4	
		12/23/2013		12/23/2013		12/23/2013	
Parameter	**MCL (mg/l)**	**Value (mg/l)**	**Qual**	**Value (mg/l)**	**Qual**	**Value (mg/l)**	**Qual**
Chloride	250 [2]	**1.5**		**35**		**6.4**	
Nitrate	10	<0.10		**12**		**0.75**	
Sulfate	250 [2]	**6.1**		**12**		<5.0	
Ammonia Nitrogen	-	**0.1**		**1.9**		**0.12**	
Antimony	0.006	<0.0010		<0.0010		<0.0010	
Arsenic	0.01	**0.1**		<0.0010		<0.0010	
Beryllium	0.004	<0.0010		<0.0010		<0.0010	
Cadmium	0.005	<0.00050		<0.00050		<0.00050	
Copper	1.3	<0.0020		<0.00020		<0.0020	
Lead	0.015	**0.0023**		**0.0016**		**0.0014**	
Selenium	0.05	<0.0010		<0.0010		<0.0010	
Thallium	0.002	<0.0010		<0.0010		<0.0010	
Zinc	5 [2]	**0.023**		<0.010		**0.031**	
Mercury	0.002	**0.00077**		<0.00020		<0.00020	
Aluminum	0.2 [2]	<0.1		**0.13**		<0.1	
Barium	2	**0.017**		**0.15**		**0.0096**	
Boron	-	<0.20		<0.20		<0.20	
Calcium	-	**3.5**		**15**		**2.8**	
Chromium	0.1	<0.010		<0.010		<0.010	
Cobalt	-	**0.028**		<0.010		<0.010	
Iron	0.3 [2]	**17**		<0.10		<0.10	
Magnesium	-	**2.8**		**5.3**		**1.8**	
Manganese	0.05 [2]	**0.83**		**0.4**		**0.26**	
Nickel	-	<0.020		<0.020		<0.020	
Potassium	-	**1.2**		**10**		**1.5**	
Silver	0.10 [2]	<0.010		<0.010		<0.010	
Sodium	-	**6**		**21**		**5.3**	
Vanadium	-	<0.010		<0.010		<0.010	

Notes:

MCL: Maximum Contaminant Level Enforceable National Primary Drinking Water Standards

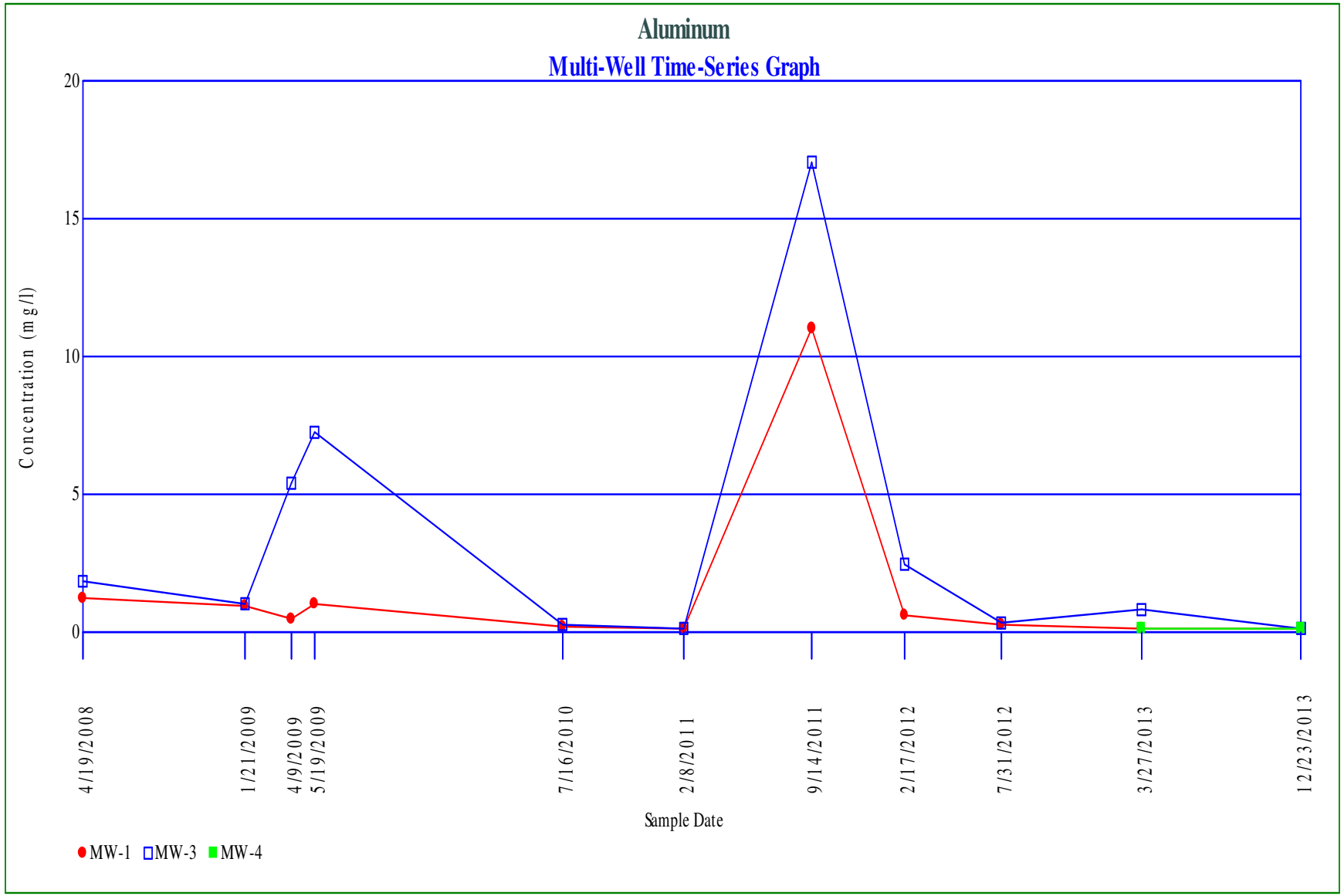
2: Non-Enforceable National Secondary Drinking Water Standard

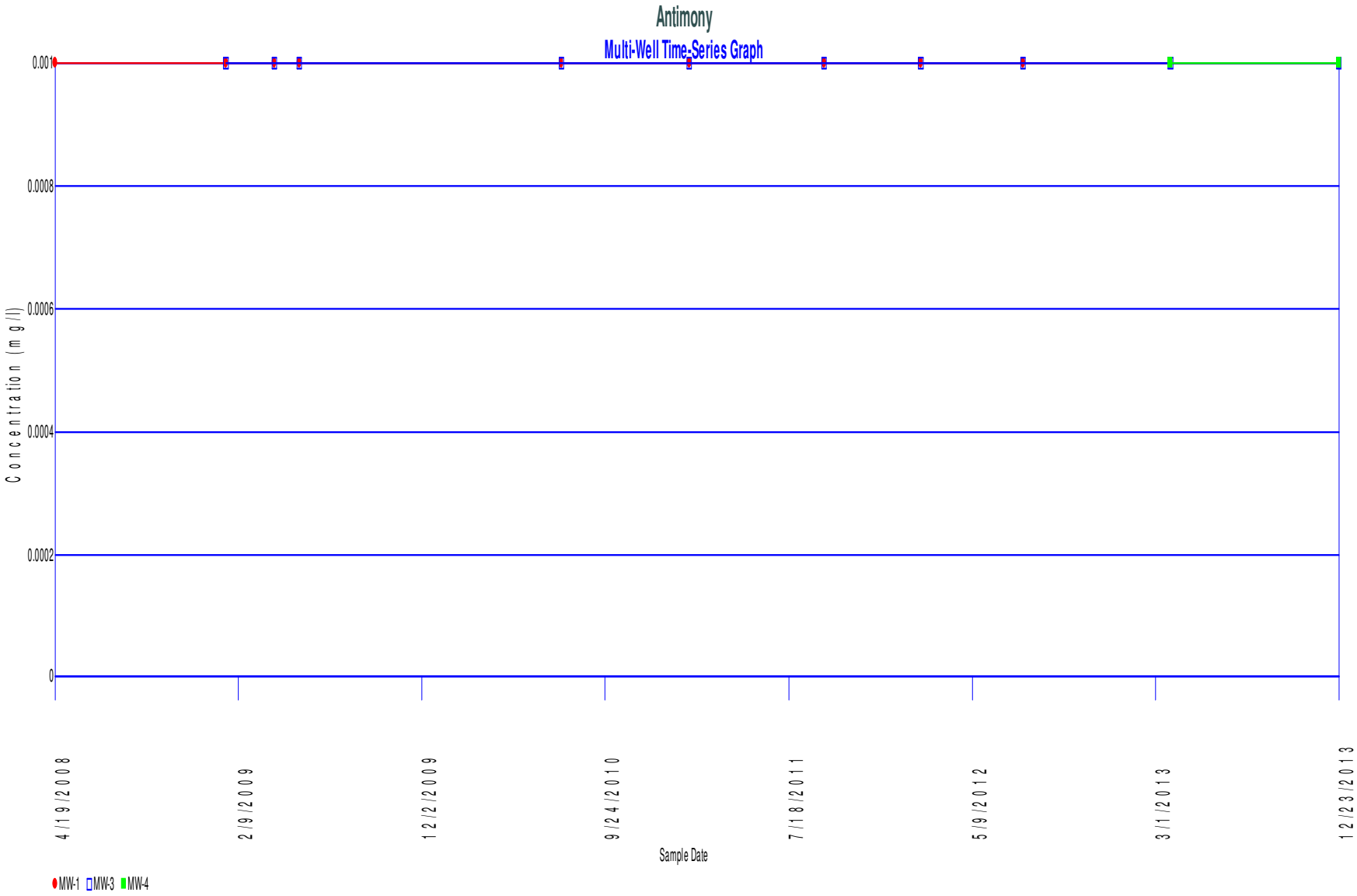
Bold text indicates laboratory analytical detections above the practical quantitation level

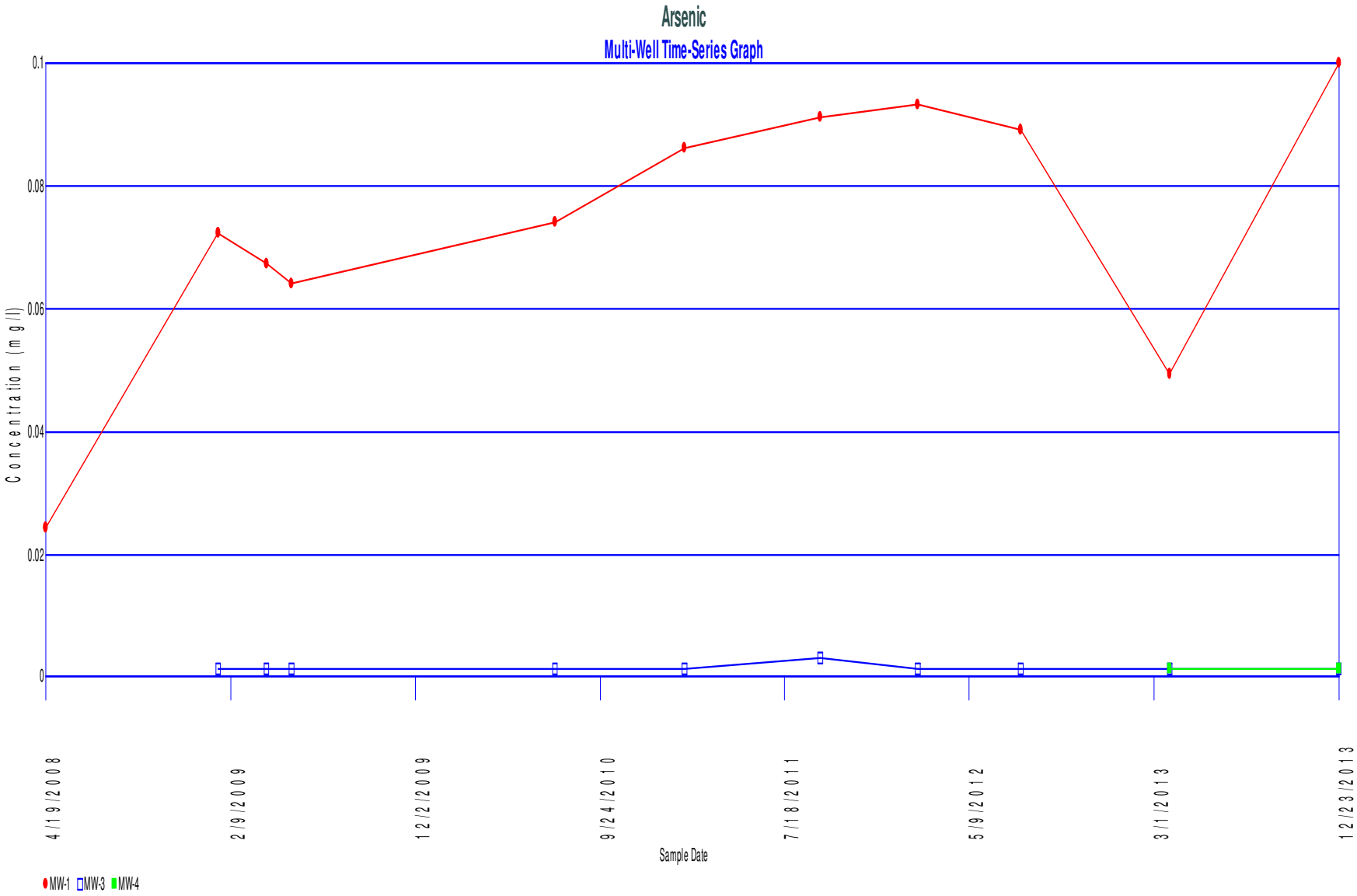
Greyed text indicates detection above respective MCL

APPENDIX B

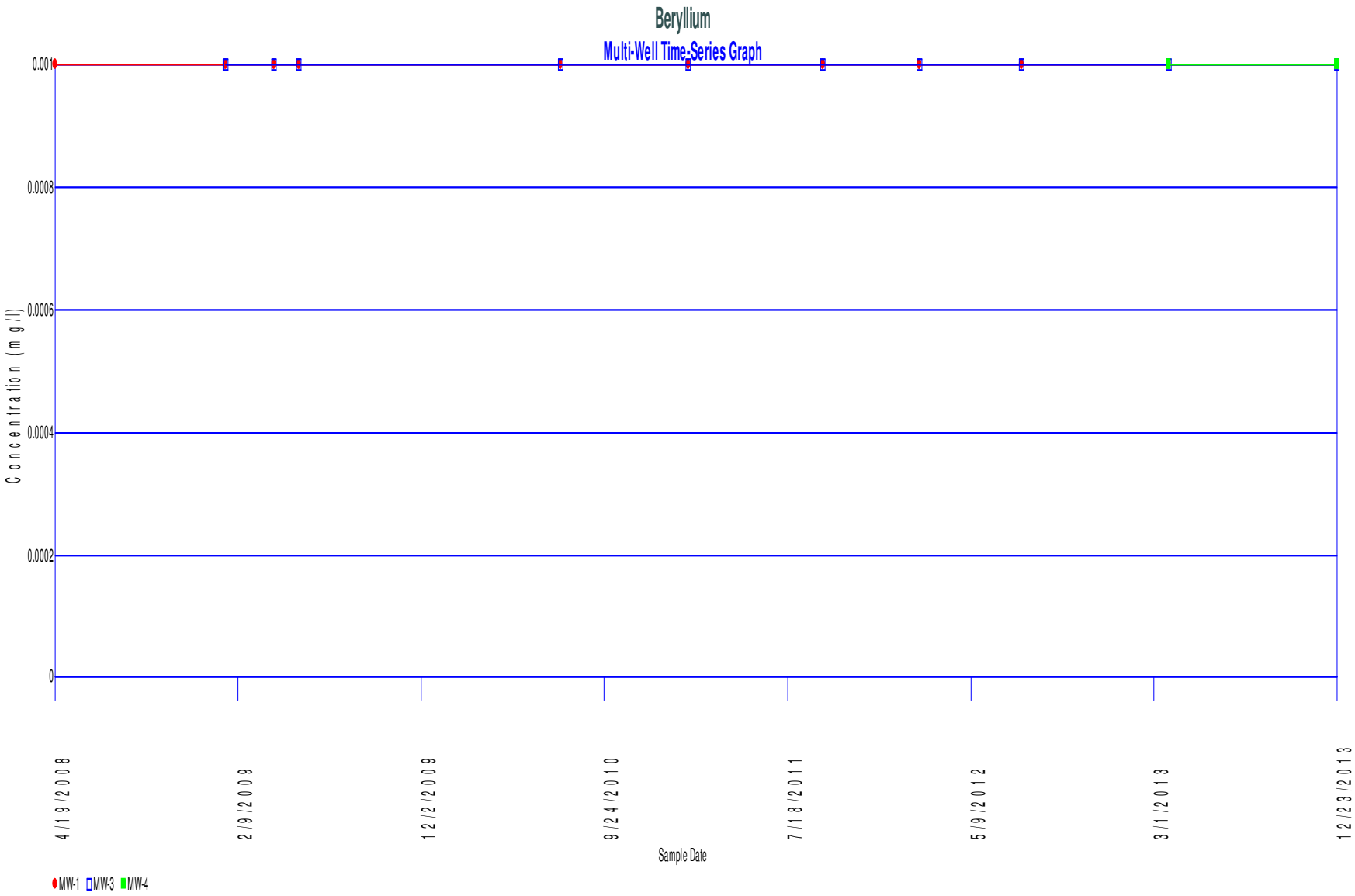
STATISTICAL EVALUATIONS & TIME SERIES PLOTS

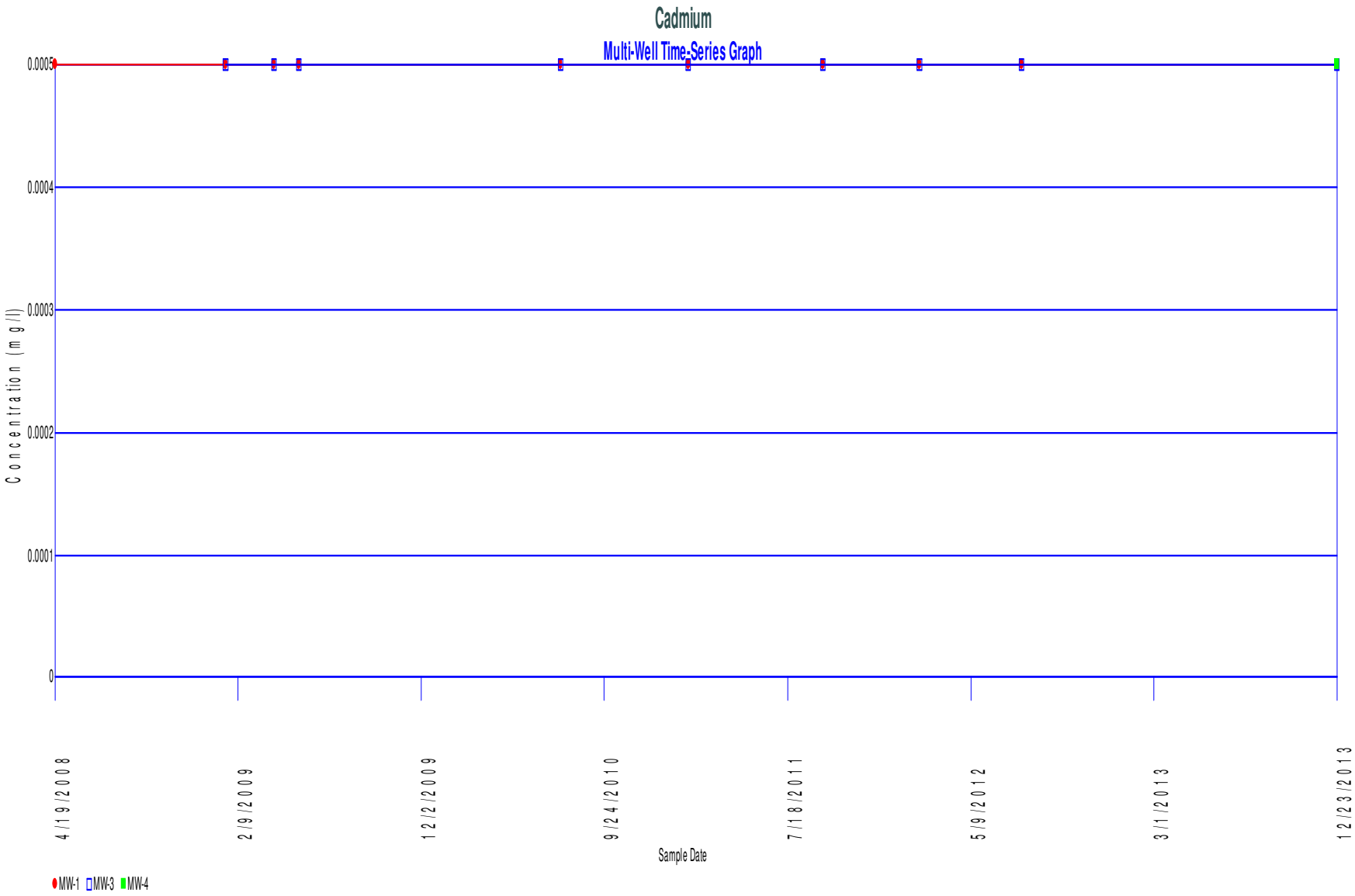

Aluminum
Multi-Well Time-Series Graph
Concentration (mg/l)
20
15
10
5
0
4/19/2008
1/21/2009
4/9/2009
5/19/2009
7/16/2010
2/8/2011
9/14/2011
2/17/2012
7/31/2012
3/27/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

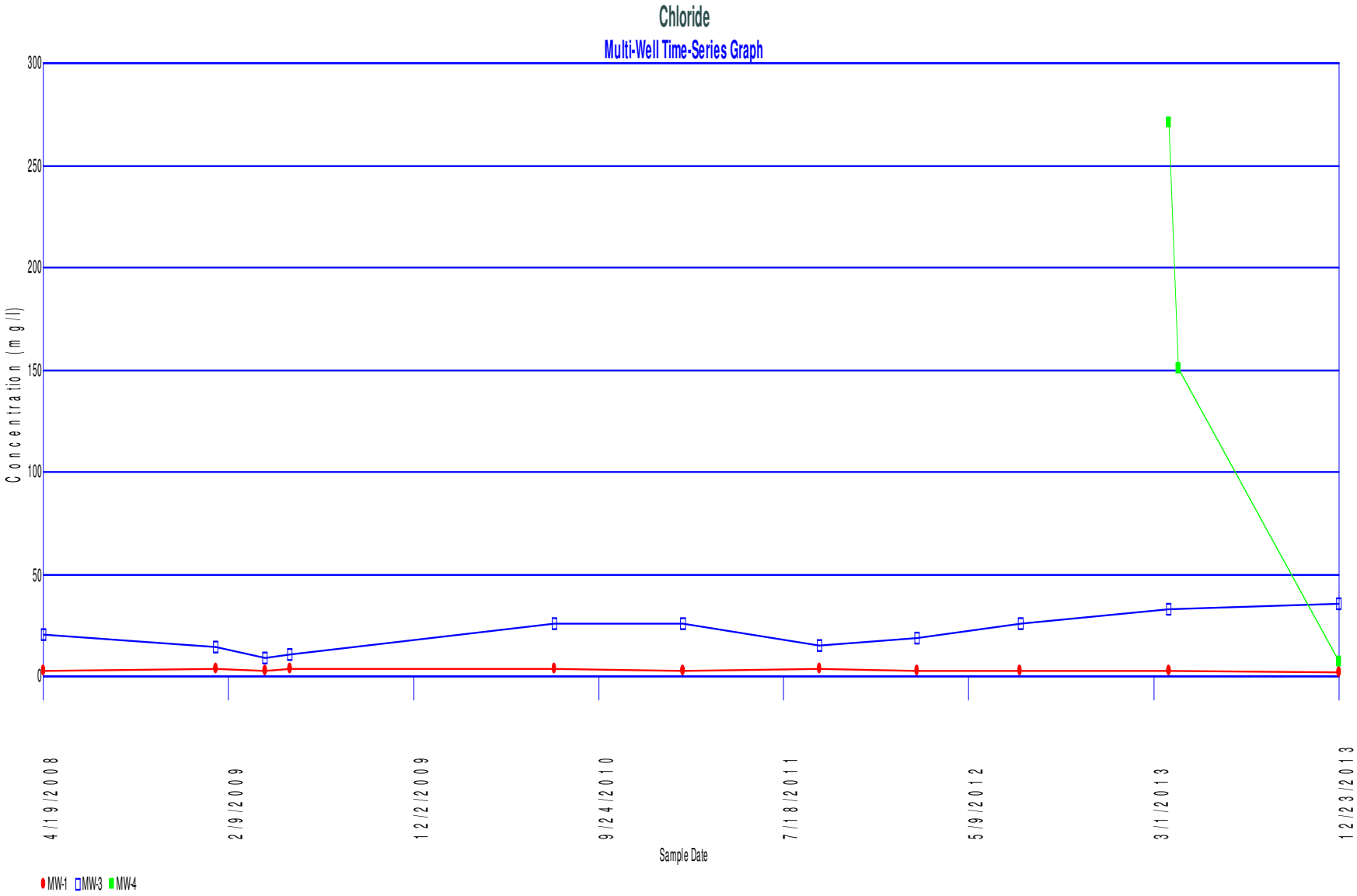

Antimony
Multi-Well Time-Series Graph
0.001
0.0008
0.0006
0.0004
0.0002
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

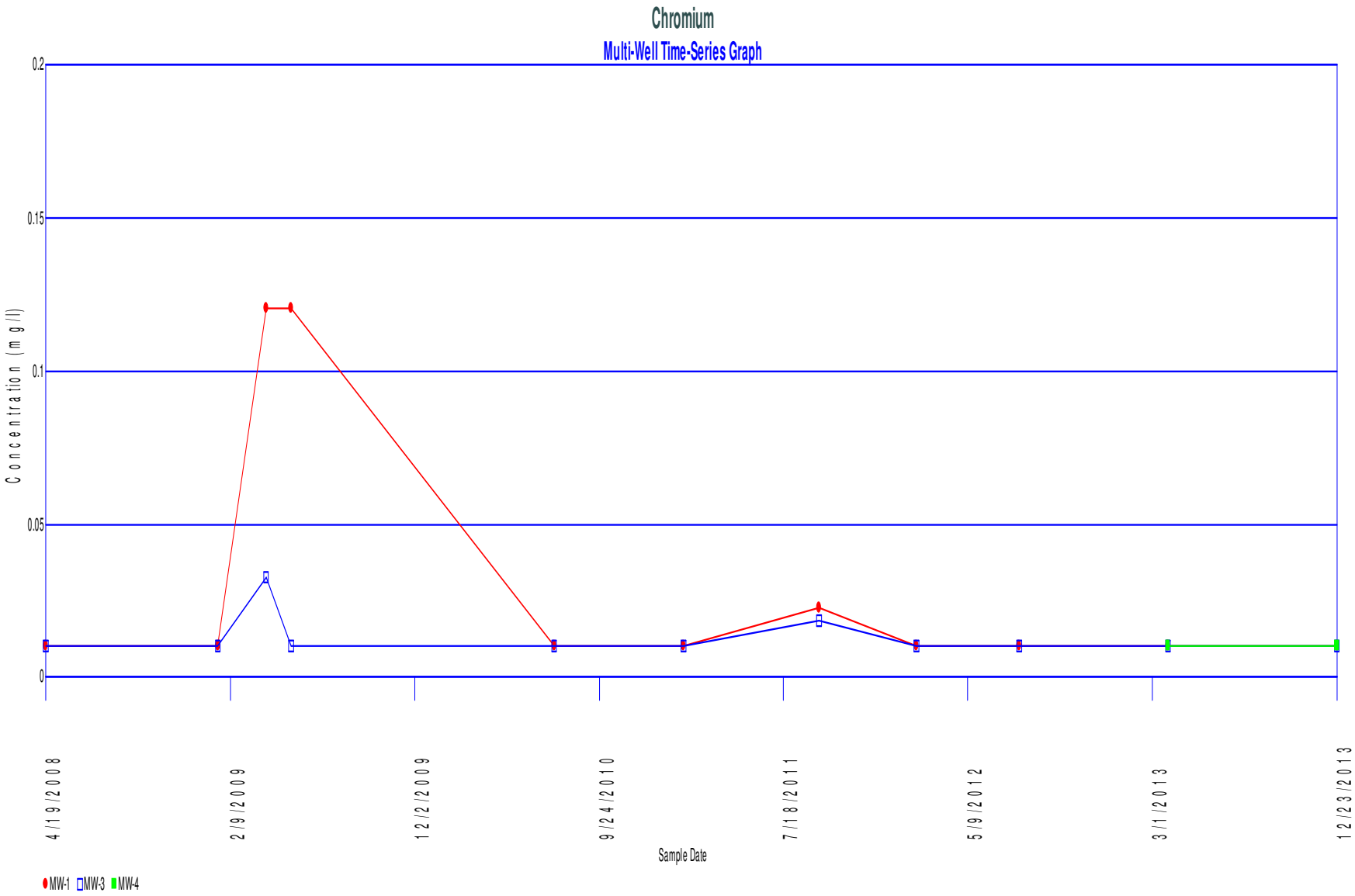

Arsenic
Multi-Well Time-Series Graph
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

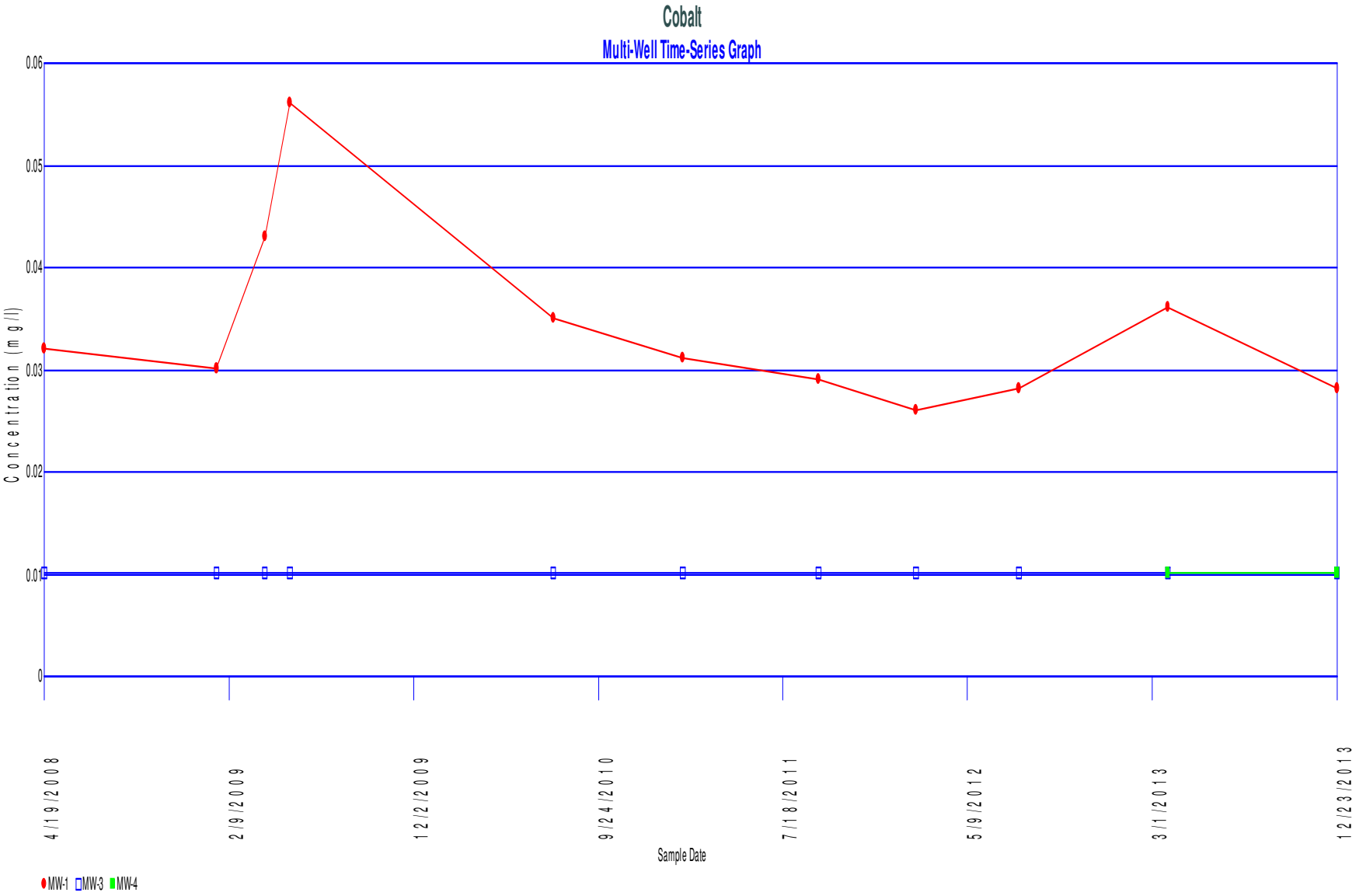

Barium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

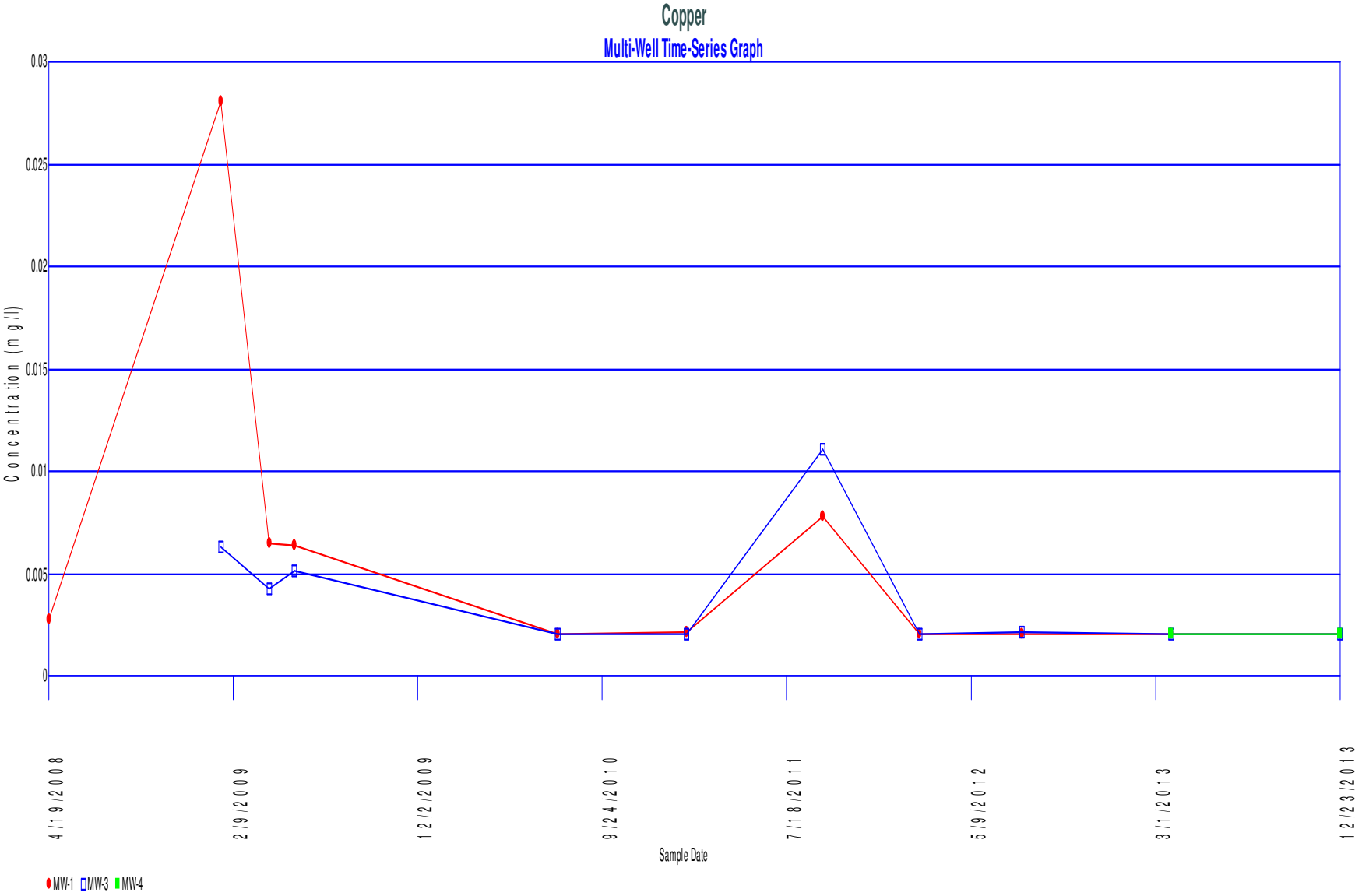

Beryllium
Multi-Well Time-Series Graph
0.001
0.0008
0.0006
0.0004
0.0002
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

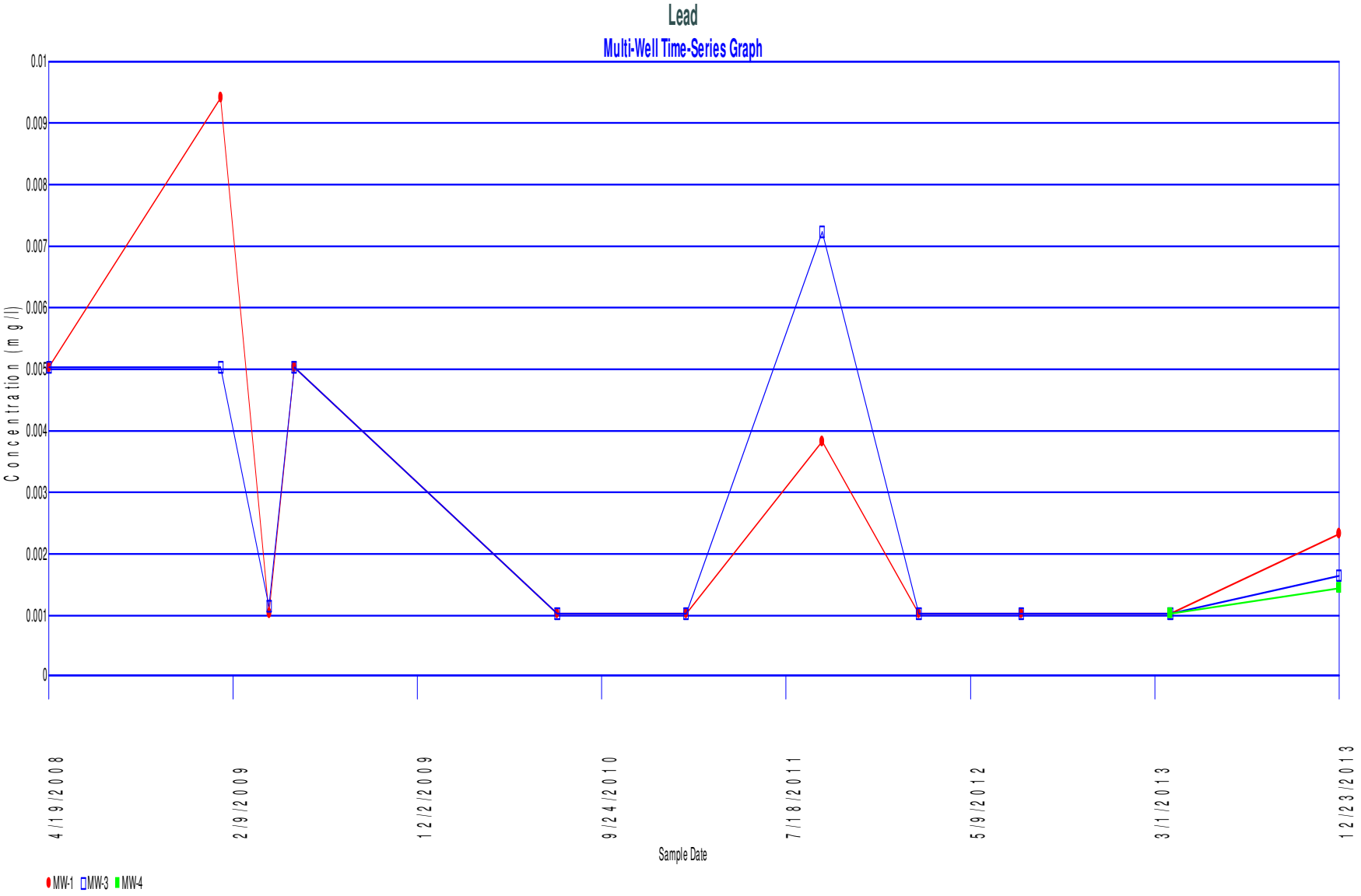

Cadmium
Multi-Well Time-Series Graph
0.0005
0.0004
0.0003
0.0002
0.0001
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

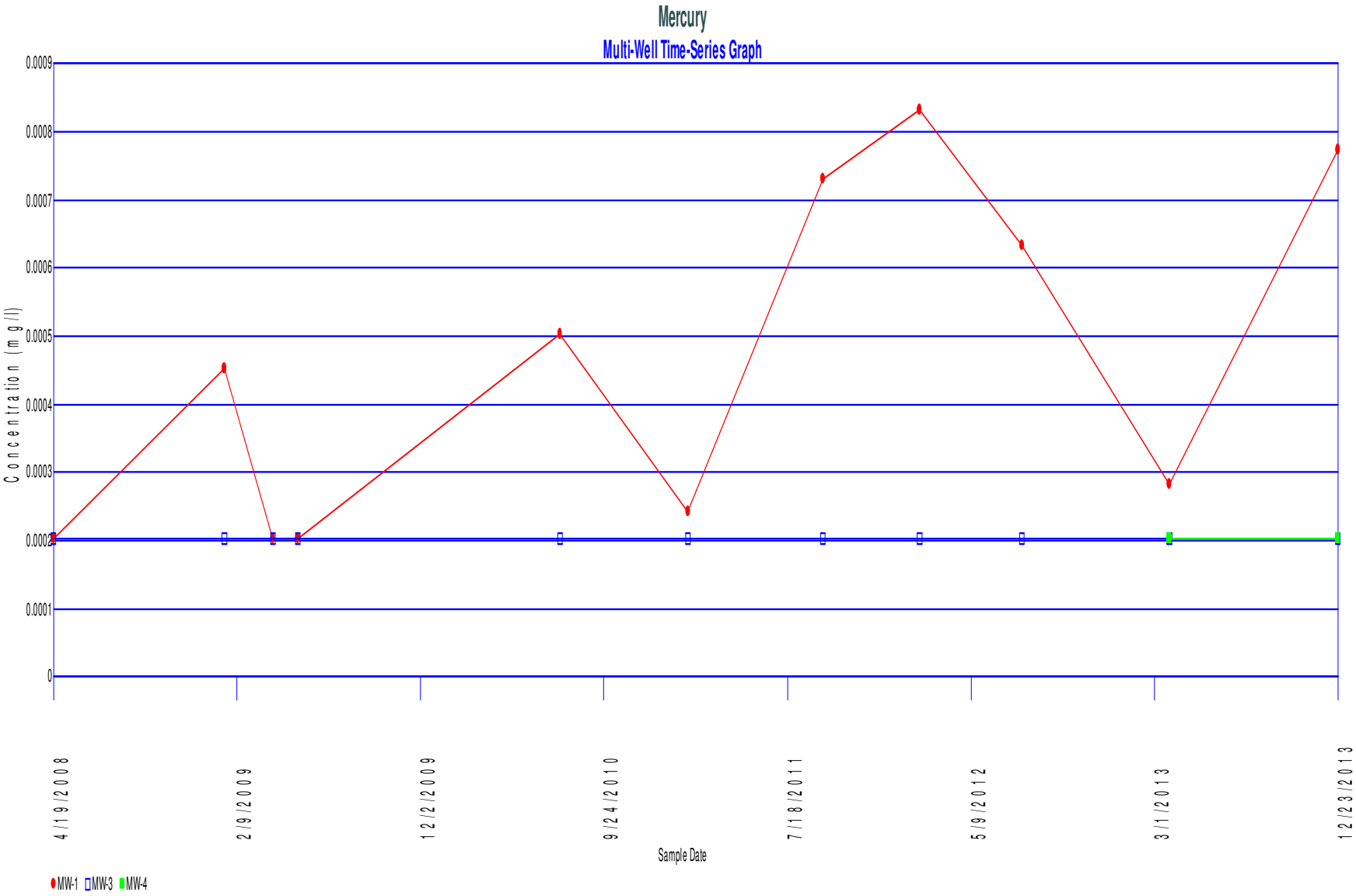

Chloride
Multi-Well Time-Series Graph
300
250
200
150
100
50
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

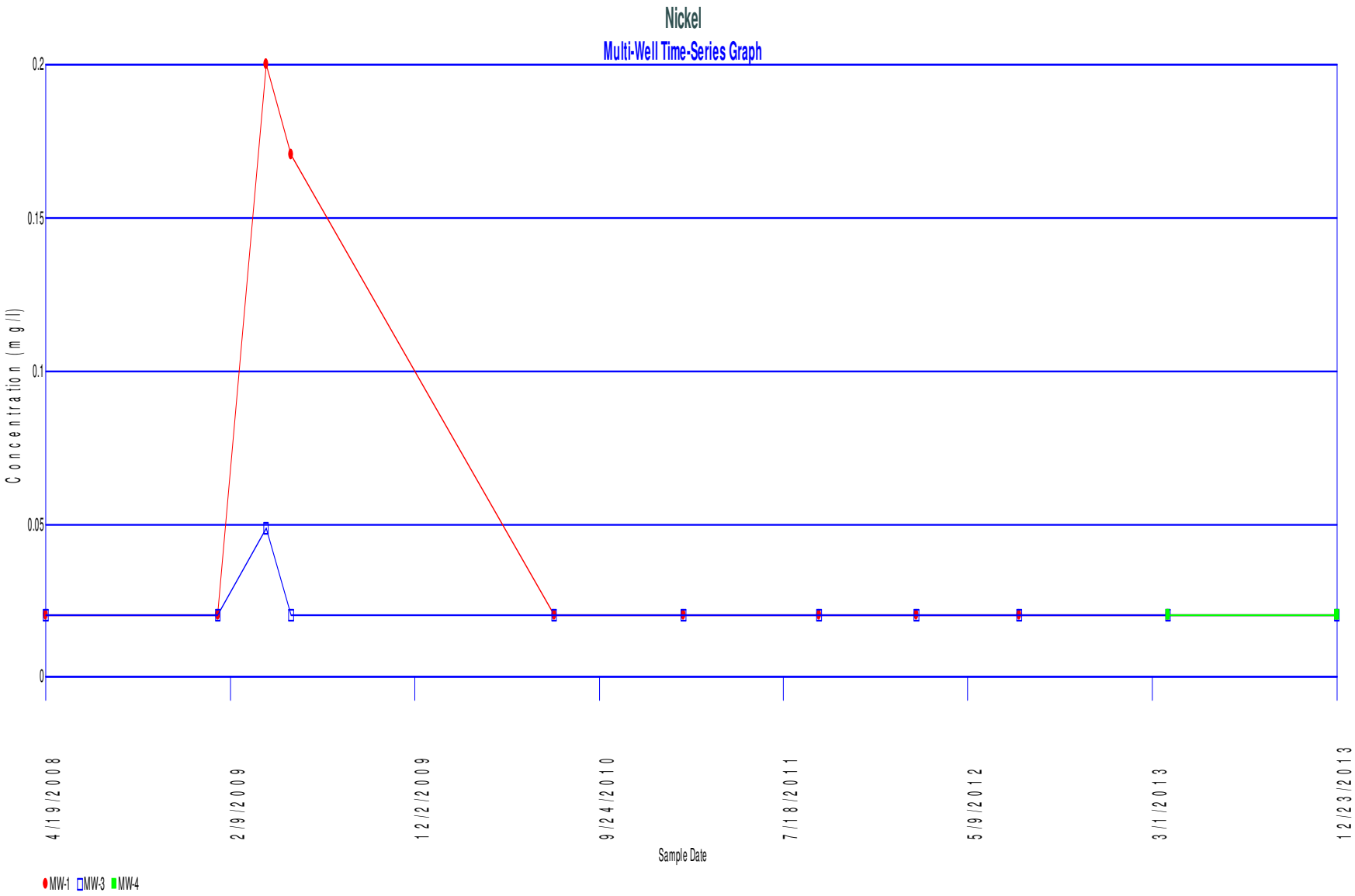

Chromium
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

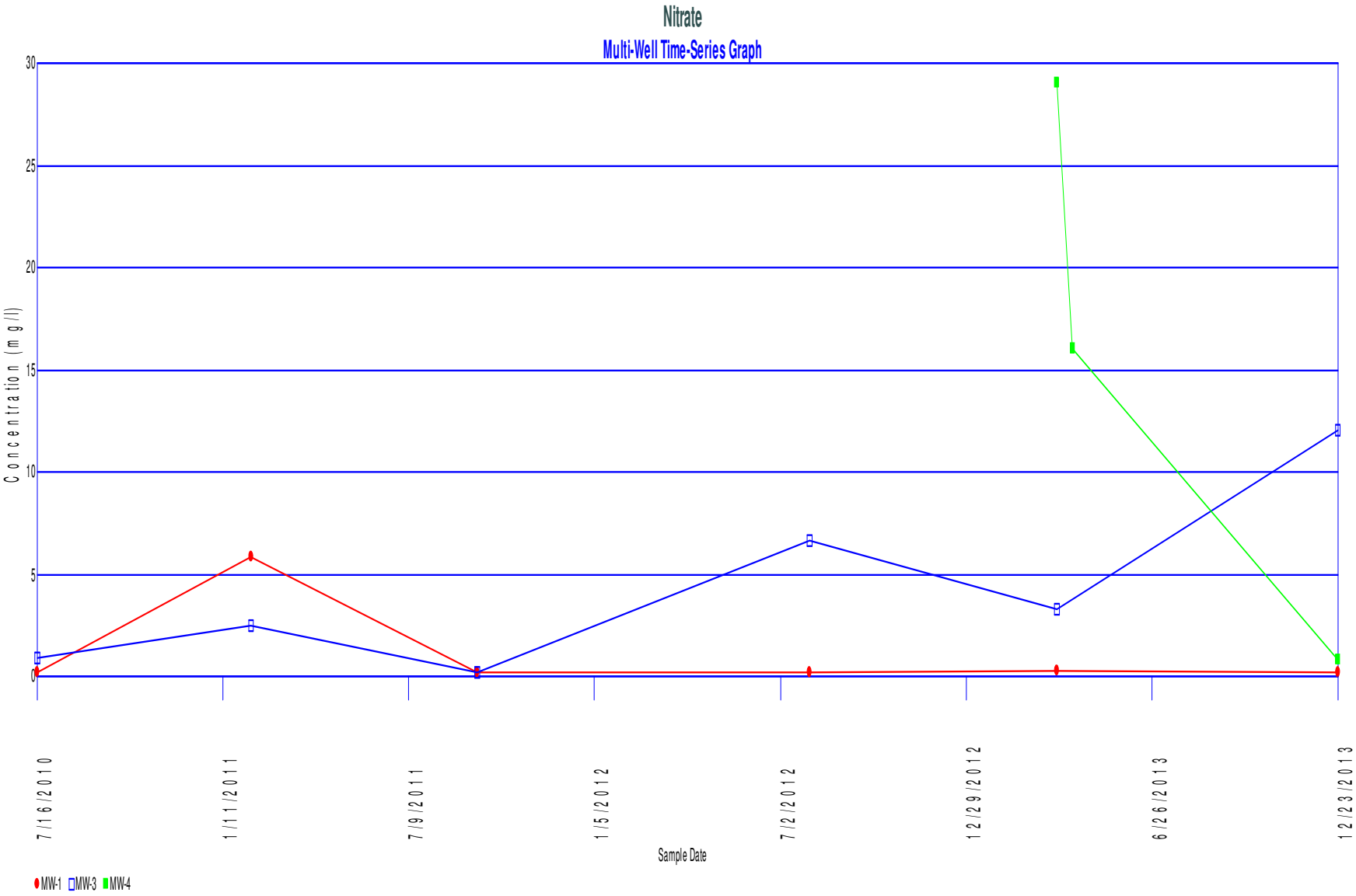

Cobalt
Multi-Well Time-Series Graph
0.06
0.05
0.04
0.03
0.02
0.01
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

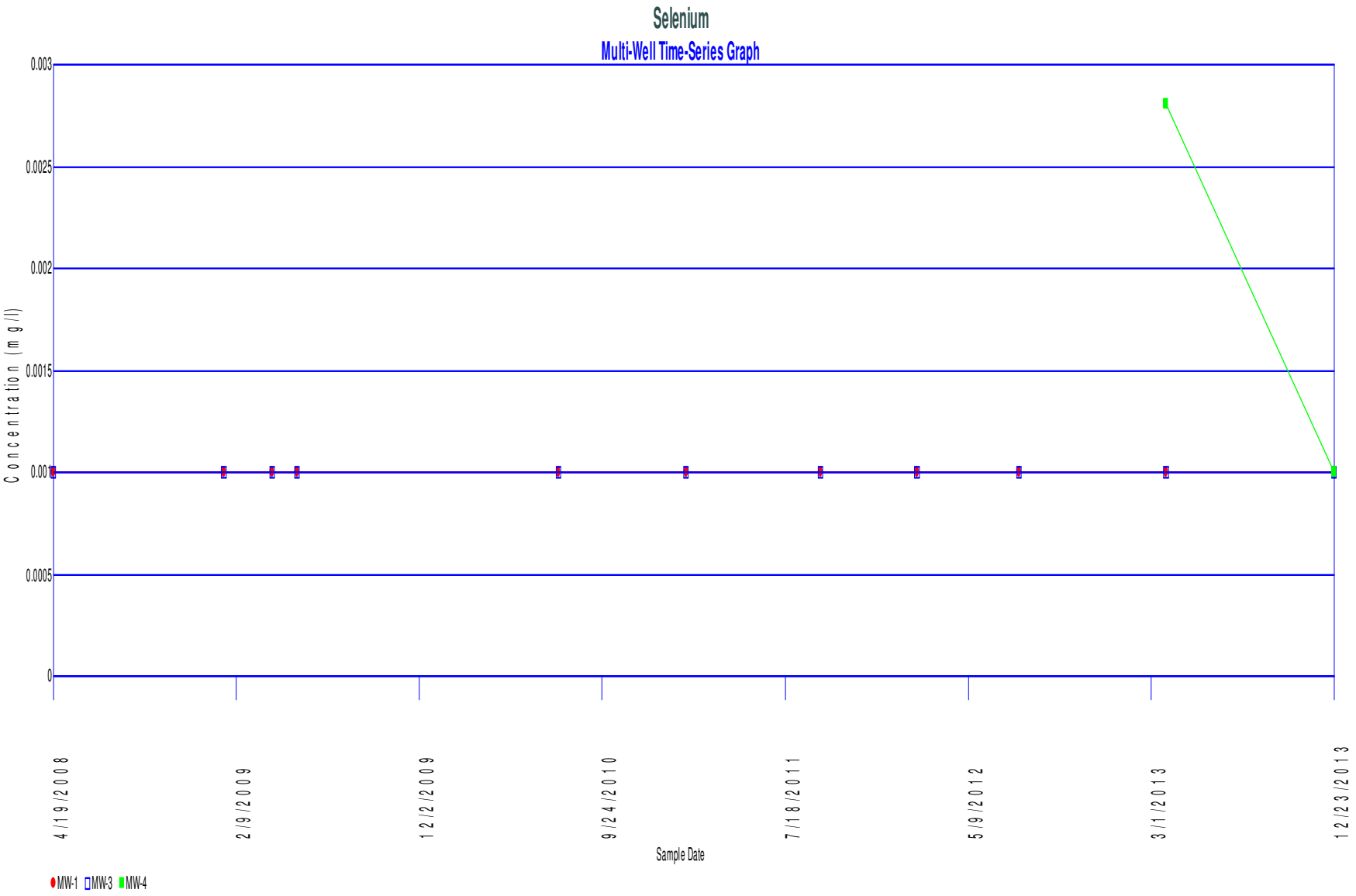

Copper
Multi-Well Time-Series Graph
0.03
0.025
0.02
0.015
0.01
0.005
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

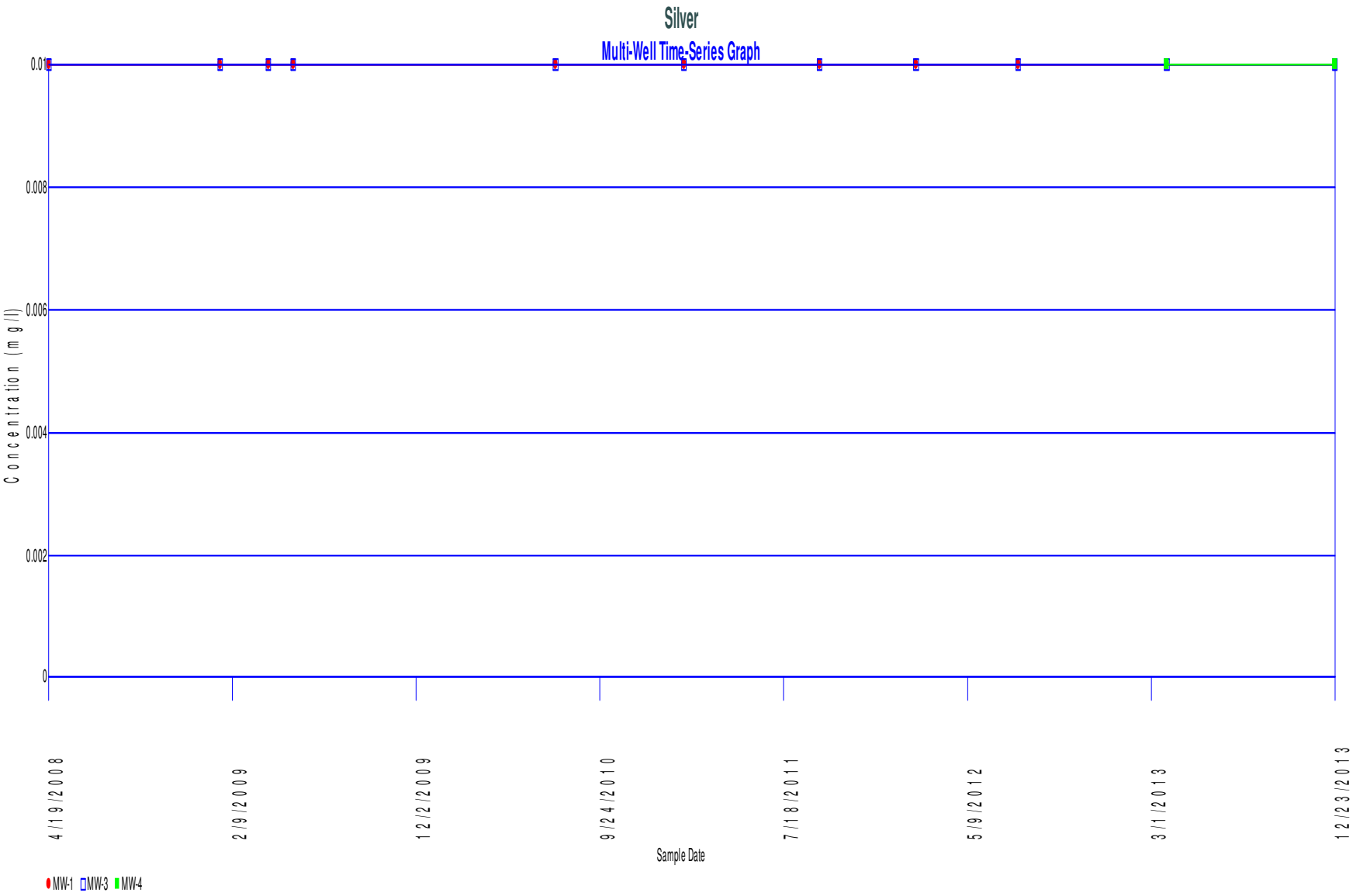

Lead
Multi-Well Time-Series Graph
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

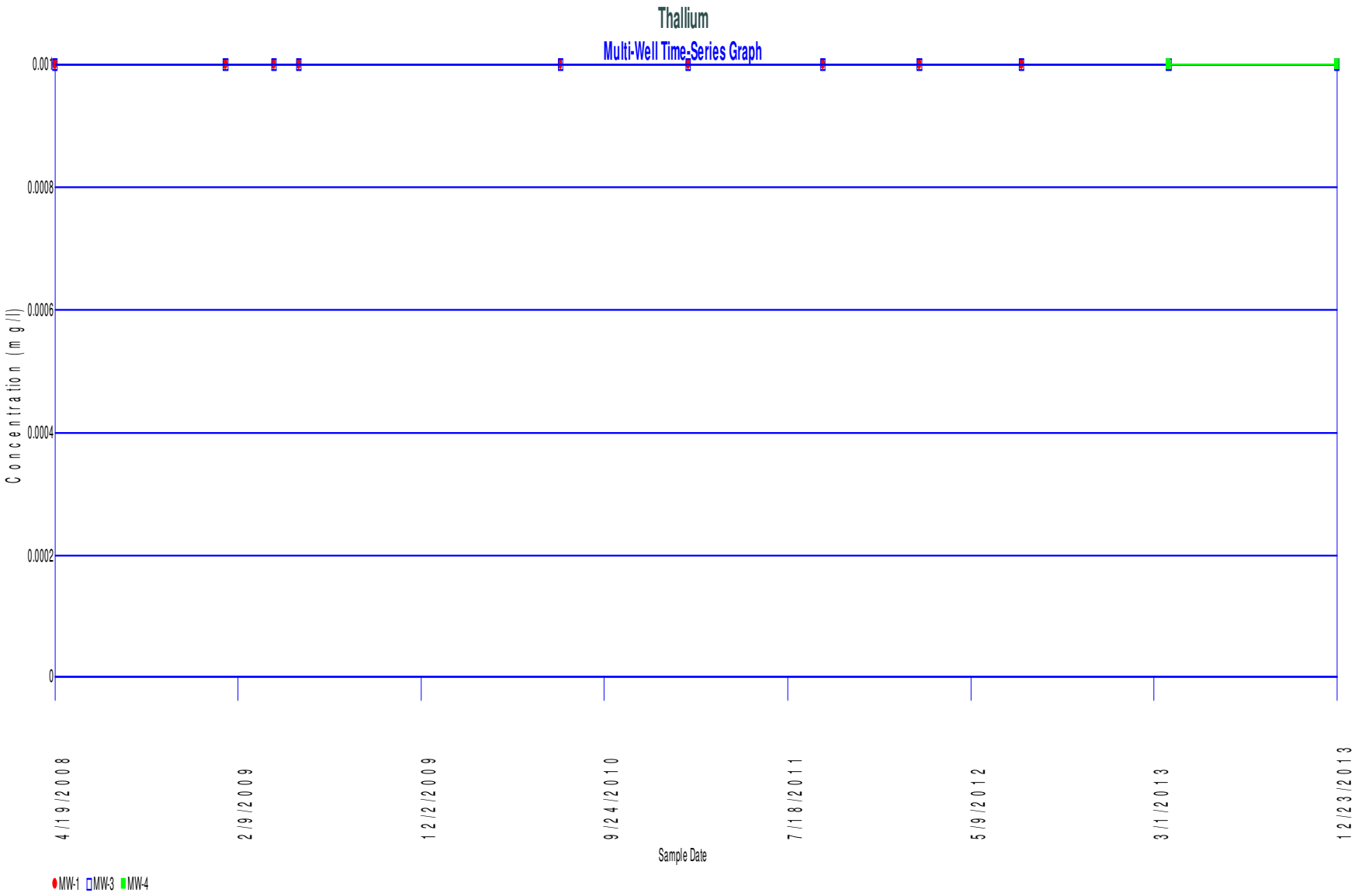

Mercury
Multi-Well Time-Series Graph
0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

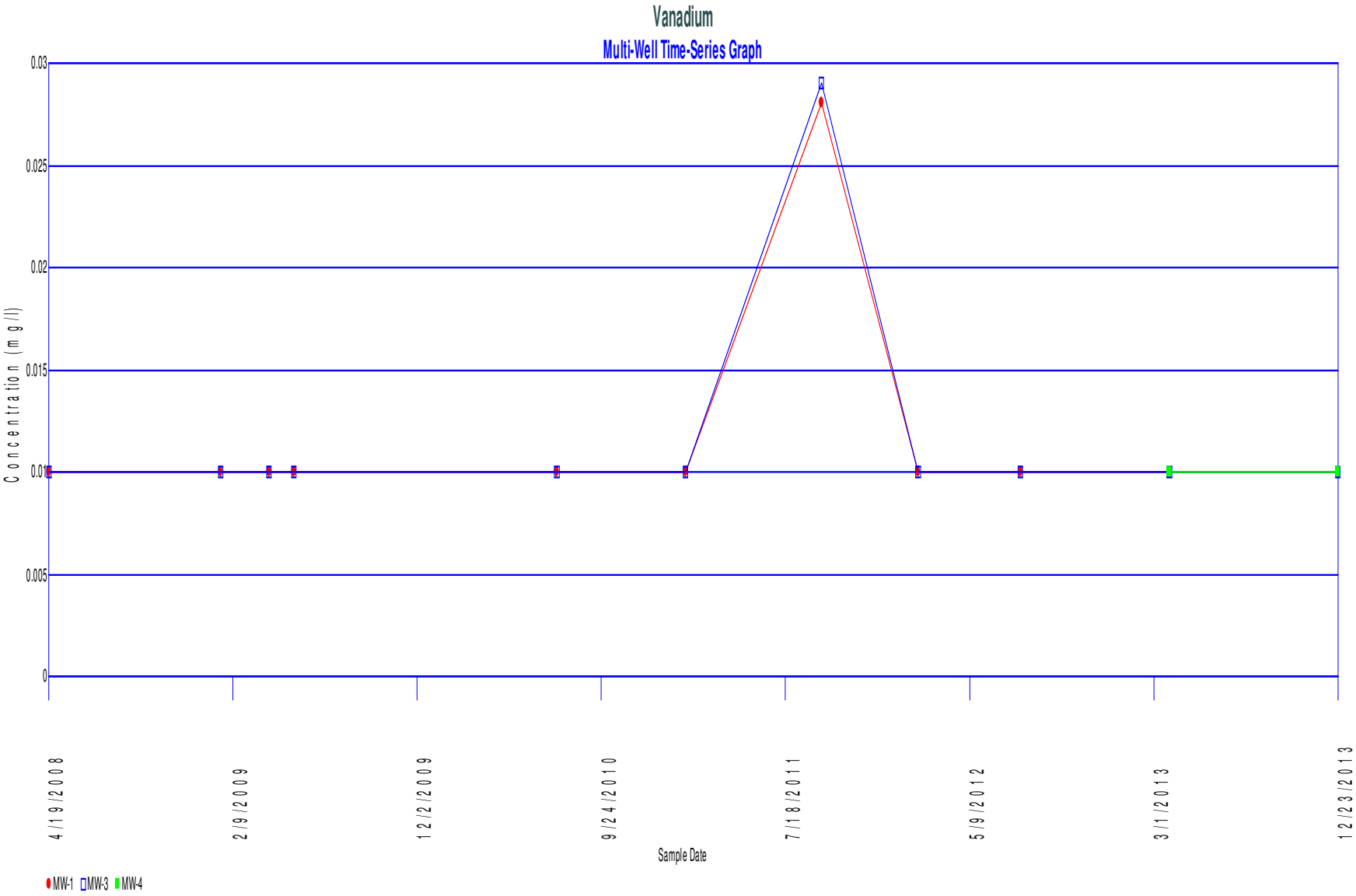

Nickel
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

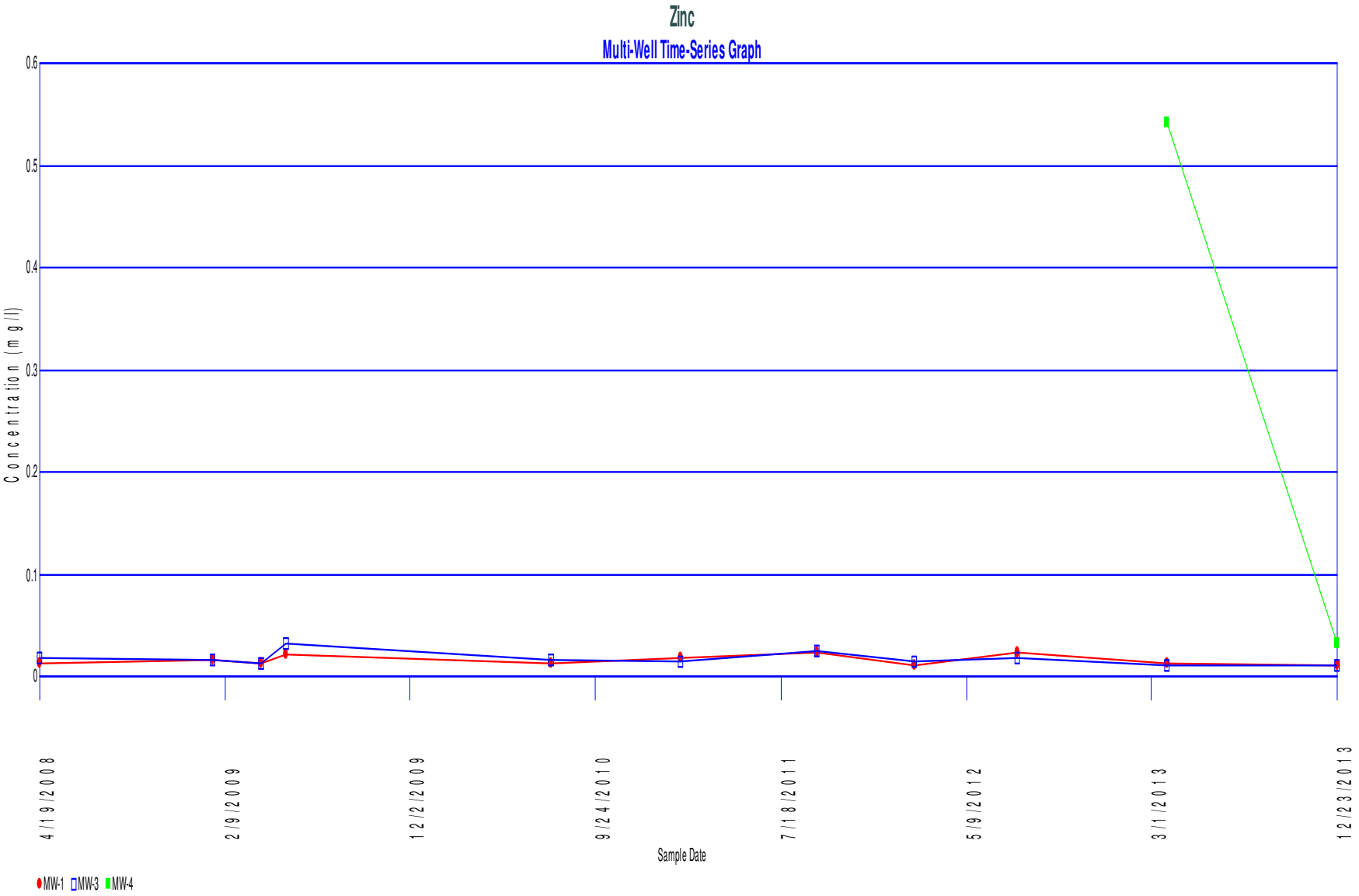

Nitrate
Multi-Well Time-Series Graph
30
25
20
15
10
5
0
Concentration (mg/l)
7/16/2010
1/11/2011
7/9/2011
1/5/2012
7/2/2012
12/29/2012
6/26/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4


Selenium
Multi-Well Time-Series Graph
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4


Silver
Multi-Well Time-Series Graph
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4


Thallium
Multi-Well Time-Series Graph
0.001
0.0008
0.0006
0.0004
0.0002
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4


Vanadium
Multi-Well Time-Series Graph
0.03
0.025
0.02
0.015
0.01
0.005
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4


Zinc
Multi-Well Time-Series Graph
0.6
0.5
0.4
0.3
0.2
0.1
0
Concentration (mg/l)
4/19/2008
2/9/2009
12/2/2009
9/24/2010
7/18/2011
5/9/2012
3/1/2013
12/23/2013
Sample Date
MW-1
MW-3
MW-4

Concentrations (mg/l)

Parameter: Aluminum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 24
Total Non-Detect: 5
Percent Non-Detects: 20.8333%
Total Background Measurements: 11
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	11	2 (18.1818%)	4/19/2008	1.2	1.2
			1/21/2009	0.94	0.94
			4/9/2009	0.44	0.44
			5/19/2009	1	1
			7/16/2010	0.2	0.2
			2/8/2011	0.12	0.12
			9/14/2011	11	11
			2/17/2012	0.57	0.57
			7/31/2012	0.24	0.24
			3/27/2013	ND<0.1	ND<0.1
			12/23/2013	ND<0.1	ND<0.1

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	11	1 (9.09091%)	4/19/2008	1.8	1.8
			1/21/2009	0.96	0.96
			4/9/2009	5.4	5.4
			5/19/2009	7.2	7.2
			7/16/2010	0.25	0.25
			2/8/2011	ND<0.1	ND<0.1
			9/14/2011	17	17
			2/17/2012	2.4	2.4
			7/31/2012	0.33	0.33
			3/27/2013	0.82	0.82
			12/23/2013	0.13	0.13
MW-4	2	2 (100%)	3/27/2013	ND<0.1	ND<0.1
			12/23/2013	ND<0.1	ND<0.1

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	8	0 (0%)	4/19/2008	6	6
			1/21/2009	2	2
			4/9/2009	5.8	5.8
			5/19/2009	1.4	1.4
			7/16/2010	13	13
			2/8/2011	0.47	0.47
			2/17/2012	16	16
			8/1/2012	0.16	0.16

Concentrations (mg/l)

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 24
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 11
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	11	0 (0%)	4/19/2008	0.084	0.084
			1/21/2009	0.028	0.028
			4/9/2009	0.028	0.028
			5/19/2009	0.033	0.033
			7/16/2010	0.021	0.021
			2/8/2011	0.021	0.021
			9/14/2011	0.074	0.074
			2/17/2012	0.022	0.022
			7/31/2012	0.019	0.019
			3/27/2013	0.018	0.018
			12/23/2013	0.017	0.017

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	11	0 (0%)	4/19/2008	0.056	0.056
			1/21/2009	0.039	0.039
			4/9/2009	0.043	0.043
			5/19/2009	0.047	0.047
			7/16/2010	0.055	0.055
			2/8/2011	0.052	0.052
			9/14/2011	0.15	0.15
			2/17/2012	0.097	0.097
			7/31/2012	0.091	0.091
			3/27/2013	0.094	0.094
			12/23/2013	0.15	0.15
MW-4	2	0 (0%)	3/27/2013	0.4	0.4
			12/23/2013	0.0096	0.0096

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	8	0 (0%)	4/19/2008	0.14	0.14
			1/21/2009	0.088	0.088
			4/9/2009	0.093	0.093
			5/19/2009	0.092	0.092
			7/16/2010	0.28	0.28
			2/8/2011	0.15	0.15
			2/17/2012	0.27	0.27
			8/1/2012	0.3	0.3

Concentrations (mg/l)

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 25
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 11
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	11	0 (0%)	4/19/2008	2	2
			1/21/2009	2.9	2.9
			4/9/2009	1.9	1.9
			5/19/2009	2.8	2.8
			7/16/2010	2.8	2.8
			2/8/2011	2.6	2.6
			9/14/2011	3.1	3.1
			2/17/2012	2.1	2.1
			7/31/2012	2.2	2.2
			3/27/2013	1.8	1.8
			12/23/2013	1.5	1.5

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	11	0 (0%)	4/19/2008	20	20
			1/21/2009	14	14
			4/9/2009	8.2	8.2
			5/19/2009	10	10
			7/16/2010	25	25
			2/8/2011	25	25
			9/14/2011	15	15
			2/17/2012	18	18
			8/1/2012	25	25
			3/27/2013	32	32
			12/23/2013	35	35
MW-4	3	0 (0%)	3/27/2013	270	270
			4/11/2013	150	150
			12/23/2013	6.4	6.4

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	9	0 (0%)	4/19/2008	1.9	1.9
			1/21/2009	3.3	3.3
			4/9/2009	2.3	2.3
			5/19/2009	3.2	3.2
			7/16/2010	34	34
			2/8/2011	44	44
			11/10/2011	67	67
			2/17/2012	27	27

	8/1/2012	16	16

Concentrations (mg/l)

Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 24
Total Non-Detect: 16
Percent Non-Detects: 66.6667%
Total Background Measurements: 11
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	11	8 (72.7273%)	4/19/2008	-0.005	-0.005
			1/21/2009	0.0094	0.0094
			4/9/2009	-0.001	-0.001
			5/19/2009	-0.005	-0.005
			7/16/2010	-0.001	-0.001
			2/8/2011	-0.001	-0.001
			9/14/2011	0.0038	0.0038
			2/17/2012	-0.001	-0.001
			7/31/2012	-0.001	-0.001
			3/27/2013	-0.001	-0.001
			12/23/2013	0.0023	0.0023

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	11	7 (63.6364%)	4/19/2008	-0.005	-0.005
			1/21/2009	-0.005	-0.005
			4/9/2009	0.0011	0.0011
			5/19/2009	-0.005	-0.005
			7/16/2010	-0.001	-0.001
			2/8/2011	-0.001	-0.001
			9/14/2011	0.0072	0.0072
			2/17/2012	-0.001	-0.001
			7/31/2012	0.001	0.001
			3/27/2013	-0.001	-0.001
			12/23/2013	0.0016	0.0016
MW-4	2	1 (50%)	3/27/2013	-0.001	-0.001
			12/23/2013	0.0014	0.0014

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	8	4 (50%)	4/19/2008	-0.005	-0.005
			1/21/2009	0.008	0.008
			4/9/2009	0.0018	0.0018
			5/19/2009	-0.005	-0.005
			7/16/2010	0.0074	0.0074
			2/8/2011	-0.001	-0.001
			2/17/2012	0.0041	0.0041
			8/1/2012	-0.001	-0.001

Concentrations (mg/l)

Parameter: Nitrate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 15
Total Non-Detect: 5
Percent Non-Detects: 33.3333%
Total Background Measurements: 6
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	6	4 (66.6667%)	7/16/2010	-0.1	-0.1
			2/8/2011	5.8	5.8
			9/14/2011	-0.1	-0.1
			7/31/2012	-0.1	-0.1
			3/27/2013	0.18	0.18
			12/23/2013	-0.1	-0.1

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	6	1 (16.6667%)	7/16/2010	0.87	0.87
			2/8/2011	2.4	2.4
			9/14/2011	-0.1	-0.1
			7/31/2012	6.6	6.6
			3/27/2013	3.2	3.2
			12/23/2013	12	12
MW-4	3	0 (0%)	3/27/2013	29	29
			4/11/2013	16	16
			12/23/2013	0.75	0.75

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	4	1 (25%)	7/16/2010	-0.1	-0.1
			2/8/2011	7.3	7.3
			11/10/2011	2.6	2.6
			8/1/2012	22	22

Concentrations (mg/l)

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 18
Total Non-Detect: 5
Percent Non-Detects: 27.7778%
Total Background Measurements: 8
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	8	2 (25%)	5/19/2009	8.9	8.9
			7/16/2010	9.4	9.4
			2/8/2011	5.8	5.8
			9/14/2011	6.6	6.6
			2/17/2012	-5	-5
			7/31/2012	-5	-5
			3/27/2013	5.1	5.1
			12/23/2013	6.1	6.1

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	8	2 (25%)	5/19/2009	-5	-5
			7/16/2010	5.1	5.1
			2/8/2011	-5	-5
			9/14/2011	7.3	7.3
			2/17/2012	22	22
			7/31/2012	23	23
			3/27/2013	16	16
			12/23/2013	12	12
MW-4	2	1 (50%)	3/27/2013	23	23
			12/23/2013	-5	-5

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	6	0 (0%)	5/19/2009	10	10
			7/16/2010	12	12
			2/8/2011	8.2	8.2
			11/10/2011	74	74
			2/17/2012	42	42
			8/1/2012	30	30

Concentrations (mg/l)

Parameter: Zinc

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 24
Total Non-Detect: 4
Percent Non-Detects: 16.6667%
Total Background Measurements: 11
There is 1 background location

Loc.	Meas.	ND	Date	Conc.	Original
MW-1	11	2 (18.1818%)	4/19/2008	0.011	0.011
			1/21/2009	0.015	0.015
			4/9/2009	0.011	0.011
			5/19/2009	0.021	0.021
			7/16/2010	0.011	0.011
			2/8/2011	0.016	0.016
			9/14/2011	0.022	0.022
			2/17/2012	-0.01	-0.01
			7/31/2012	0.023	0.023
			3/27/2013	0.012	0.012
			12/23/2013	-0.01	-0.01

There are 2 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-3	11	2 (18.1818%)	4/19/2008	0.017	0.017
			1/21/2009	0.015	0.015
			4/9/2009	0.011	0.011
			5/19/2009	0.031	0.031
			7/16/2010	0.015	0.015
			2/8/2011	0.013	0.013
			9/14/2011	0.024	0.024
			2/17/2012	0.014	0.014
			7/31/2012	0.016	0.016
			3/27/2013	-0.01	-0.01
			12/23/2013	-0.01	-0.01
MW-4	2	0 (0%)	3/27/2013	0.54	0.54
			12/23/2013	0.031	0.031

There is 1 unused location

Loc.	Meas.	ND	Date	Conc.	Original
MW-2	8	1 (12.5%)	4/19/2008	0.016	0.016
			1/21/2009	0.014	0.014
			4/9/2009	0.018	0.018
			5/19/2009	-0.01	-0.01
			7/16/2010	0.036	0.036
			2/8/2011	0.014	0.014
			2/17/2012	0.017	0.017
			8/1/2012	0.011	0.011

Shapiro-Wilks Test of Normality

Parameter: Aluminum

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 12 for 24 measurements

Sum of b values = 8.31894
Sample Standard Deviation = 1.78862
W Statistic = 0.940525

5% Critical value of 0.916 is less than 0.940525
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.940525
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Aluminum

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

Sum of b values = 14.9121
Sample Standard Deviation = 4.1228
W Statistic = 0.568807

5% Critical value of 0.916 exceeds 0.568807
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.568807
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Arsenic

Location: MW-1

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 5 for 11 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.024	0.1	0.076	0.5601	0.0425676
2	0.049	0.093	0.044	0.3315	0.014586
3	0.064	0.091	0.027	0.226	0.006102
4	0.067	0.089	0.022	0.1429	0.0031438
5	0.072	0.086	0.014	0.0695	0.000973
6	0.074	0.074	0		
7	0.086	0.072	-0.014		
8	0.089	0.067	-0.022		
9	0.091	0.064	-0.027		
10	0.093	0.049	-0.044		
11	0.1	0.024	-0.076		

Sum of b values = 0.0673724
Sample Standard Deviation = 0.0222951
W Statistic = 0.913154

5% Critical value of 0.85 is less than 0.913154
Data is normally distributed at 95% level of significance

1% Critical value of 0.792 is less than 0.913154
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Barium

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

Sum of b values = 0.306919
Sample Standard Deviation = 0.0808504
W Statistic = 0.626551

5% Critical value of 0.916 exceeds 0.626551
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.626551
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Barium

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 12 for 24 measurements

Sum of b values = 4.08844
Sample Standard Deviation = 0.86468
W Statistic = 0.972023

5% Critical value of 0.916 is less than 0.972023
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.972023
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: MW-1

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 5 for 11 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.5	3.1	1.6	0.5601	0.89616
2	1.8	2.9	1.1	0.3315	0.36465
3	1.9	2.8	0.9	0.226	0.2034
4	2	2.8	0.8	0.1429	0.11432
5	2.1	2.6	0.5	0.0695	0.03475
6	2.2	2.2	0		
7	2.6	2.1	-0.5		
8	2.8	2	-0.8		
9	2.8	1.9	-0.9		
10	2.9	1.8	-1.1		
11	3.1	1.5	-1.6		

Sum of b values = 1.61328
Sample Standard Deviation = 0.525876
W Statistic = 0.941137

5% Critical value of 0.85 is less than 0.941137
Data is normally distributed at 95% level of significance

1% Critical value of 0.792 is less than 0.941137
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chloride

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 25 measurements

Sum of b values = 194.681
Sample Standard Deviation = 58.6238
W Statistic = 0.459503

5% Critical value of 0.918 exceeds 0.459503
Evidence of non-normality at 95% level of significance

1% Critical value of 0.888 exceeds 0.459503
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chloride

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 12 for 25 measurements

Sum of b values = 6.64914
Sample Standard Deviation = 1.42892
W Statistic = 0.902199

5% Critical value of 0.918 exceeds 0.902199
Evidence of non-normality at 95% level of significance

1% Critical value of 0.888 is less than 0.902199
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Cobalt

Location: MW-1

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 5 for 11 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	-3.64966	-2.8824	0.767255	0.5601	0.42974
2	-3.57555	-3.14656	0.428996	0.3315	0.142212
3	-3.57555	-3.32424	0.251314	0.226	0.0567971
4	-3.54046	-3.35241	0.188052	0.1429	0.0268727
5	-3.50656	-3.44202	0.0645385	0.0695	0.00448543
6	-3.47377	-3.47377	0		
7	-3.44202	-3.50656	-0.0645385		
8	-3.35241	-3.54046	-0.188052		
9	-3.32424	-3.57555	-0.251314		
10	-3.14656	-3.57555	-0.428996		
11	-2.8824	-3.64966	-0.767255		

Sum of b values = 0.660107
Sample Standard Deviation = 0.224046
W Statistic = 0.868067

5% Critical value of 0.85 is less than 0.868067
Data is normally distributed at 95% level of significance

1% Critical value of 0.792 is less than 0.868067
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Lead

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

Sum of b values = 0.00982481
Sample Standard Deviation = 0.00240523
W Statistic = 0.725448

5% Critical value of 0.916 exceeds 0.725448
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.725448
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Lead

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 12 for 24 measurements

Sum of b values = 4.11607
Sample Standard Deviation = 0.943406
W Statistic = 0.827637

5% Critical value of 0.916 exceeds 0.827637
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.827637
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Mercury

Location: MW-1

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 5 for 11 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.0002	0.00083	0.00063	0.5601	0.000352863
2	0.0002	0.00077	0.00057	0.3315	0.000188955
3	0.0002	0.00073	0.00053	0.226	0.00011978
4	0.00024	0.00063	0.00039	0.1429	5.5731e-005
5	0.00028	0.0005	0.00022	0.0695	1.529e-005
6	0.00045	0.00045	0		
7	0.0005	0.00028	-0.00022		
8	0.00063	0.00024	-0.00039		
9	0.00073	0.0002	-0.00053		
10	0.00077	0.0002	-0.00057		
11	0.00083	0.0002	-0.00063		

Sum of b values = 0.000732619
Sample Standard Deviation = 0.000249002
W Statistic = 0.865669

5% Critical value of 0.85 is less than 0.865669
Data is normally distributed at 95% level of significance

1% Critical value of 0.792 is less than 0.865669
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Nitrate

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 7 for 15 measurements

Sum of b values = 25.4382
Sample Standard Deviation = 8.18208
W Statistic = 0.690427

5% Critical value of 0.881 exceeds 0.690427
Evidence of non-normality at 95% level of significance

1% Critical value of 0.835 exceeds 0.690427
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Nitrate

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 7 for 15 measurements

Sum of b values = 8.41516
Sample Standard Deviation = 2.41067
W Statistic = 0.870404

5% Critical value of 0.881 exceeds 0.870404
Evidence of non-normality at 95% level of significance

1% Critical value of 0.835 is less than 0.870404
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: MW-1

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5	9.4	4.4	0.6052	2.66288
2	5	8.9	3.9	0.3164	1.23396
3	5.1	6.6	1.5	0.1743	0.26145
4	5.8	6.1	0.3	0.0561	0.01683
5	6.1	5.8	-0.3		
6	6.6	5.1	-1.5		
7	8.9	5	-3.9		
8	9.4	5	-4.4		

Sum of b values = 4.17512
Sample Standard Deviation = 1.74392
W Statistic = 0.818819

5% Critical value of 0.818 is less than 0.818819
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.818819
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Sulfate

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 9 for 18 measurements

Sum of b values = 23.2462
Sample Standard Deviation = 6.62909
W Statistic = 0.723349

5% Critical value of 0.897 exceeds 0.723349
Evidence of non-normality at 95% level of significance

1% Critical value of 0.858 exceeds 0.723349
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Sulfate

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 9 for 18 measurements

Sum of b values = 3.11913
Sample Standard Deviation = 0.796816
W Statistic = 0.901366

5% Critical value of 0.897 is less than 0.901366
Data is normally distributed at 95% level of significance

1% Critical value of 0.858 is less than 0.901366
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Zinc

Location: MW-1

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 5 for 11 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	-5.29832	-3.77226	1.52606	0.5601	0.854744
2	-5.29832	-3.81671	1.4816	0.3315	0.491152
3	-4.50986	-3.86323	0.646627	0.226	0.146138
4	-4.50986	-4.13517	0.374693	0.1429	0.0535437
5	-4.50986	-4.19971	0.310155	0.0695	0.0215558
6	-4.42285	-4.42285	0		
7	-4.19971	-4.50986	-0.310155		
8	-4.13517	-4.50986	-0.374693		
9	-3.86323	-4.50986	-0.646627		
10	-3.81671	-5.29832	-1.4816		
11	-3.77226	-5.29832	-1.52606		

Sum of b values = 1.56713
Sample Standard Deviation = 0.527538
W Statistic = 0.88248

5% Critical value of 0.85 is less than 0.88248
Data is normally distributed at 95% level of significance

1% Critical value of 0.792 is less than 0.88248
Data is normally distributed at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Zinc

All Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

Sum of b values = 0.259175
Sample Standard Deviation = 0.107135
W Statistic = 0.254446

5% Critical value of 0.916 exceeds 0.254446
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.254446
Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Zinc

All Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

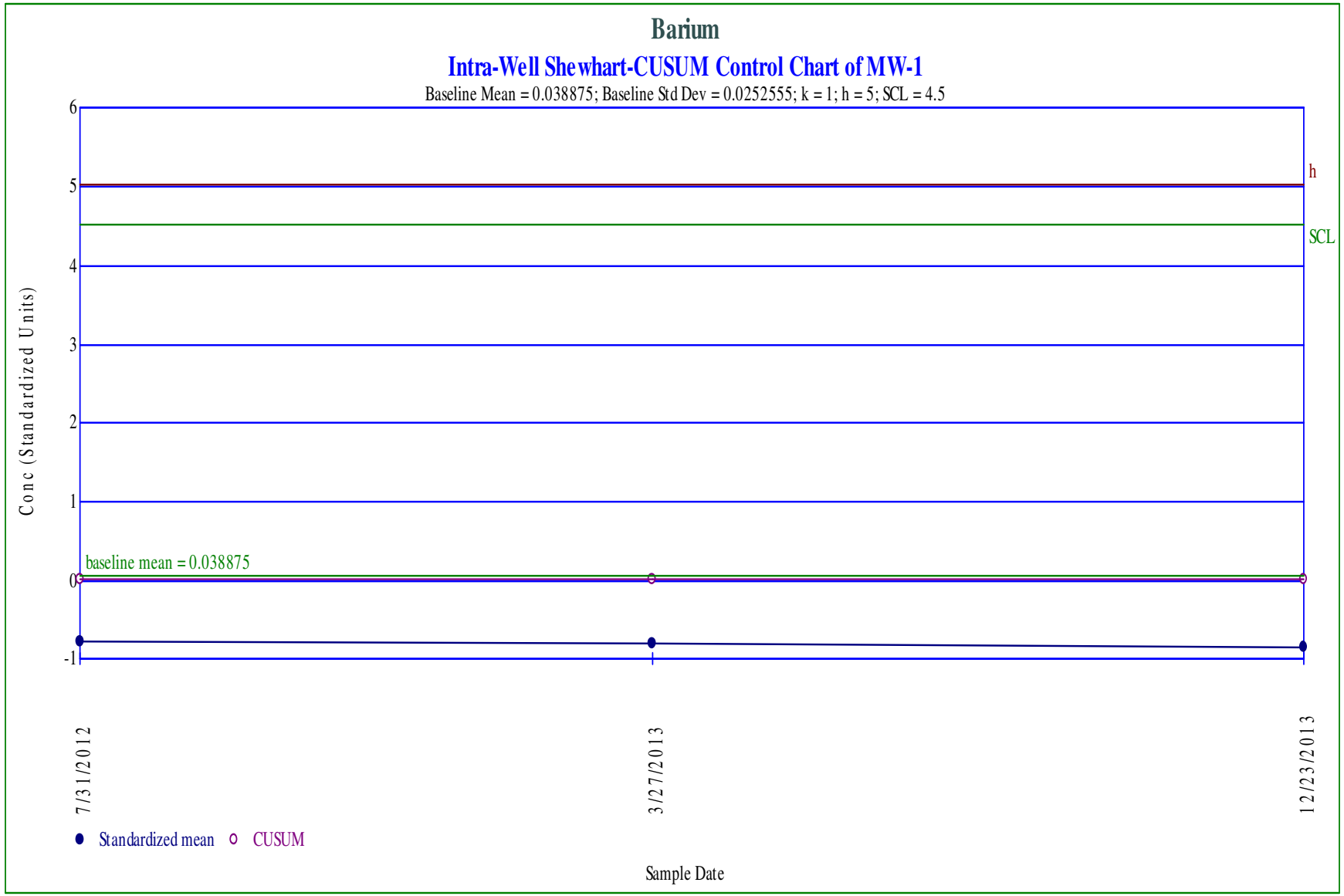
Non-Detects Replaced with 1/2 DL

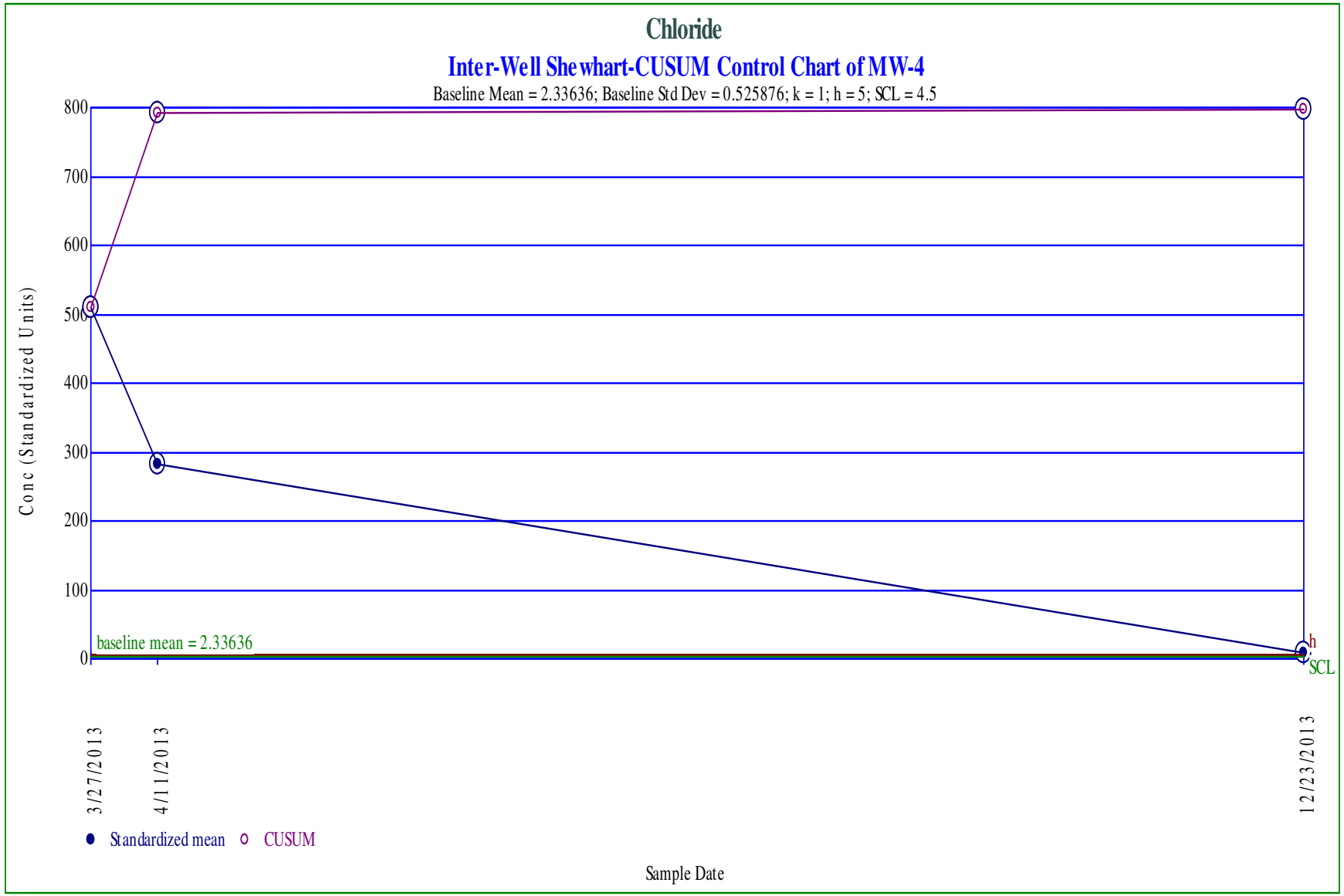
K = 12 for 24 measurements

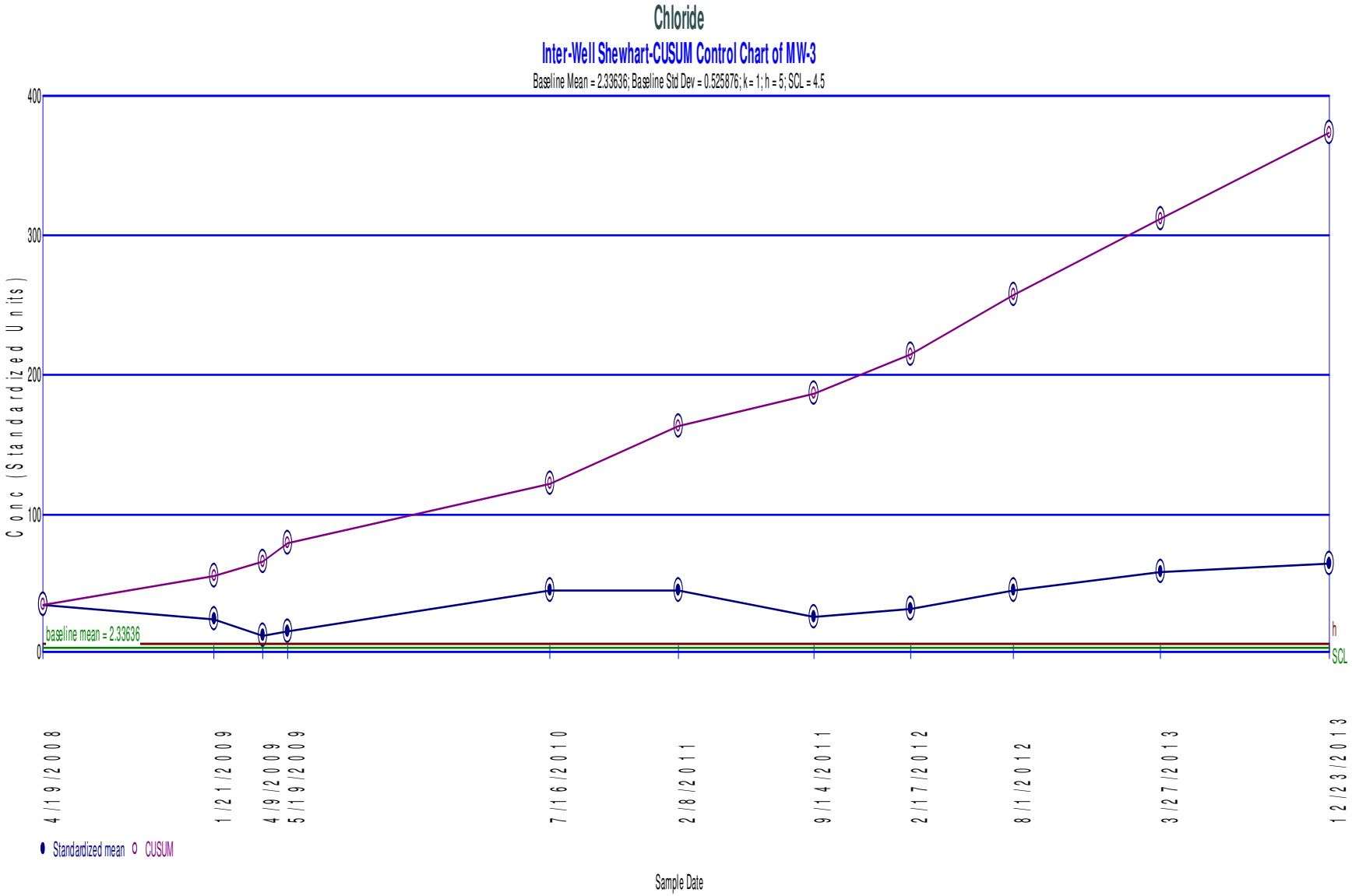
Sum of b values = 3.86876
Sample Standard Deviation = 0.928804
W Statistic = 0.754343

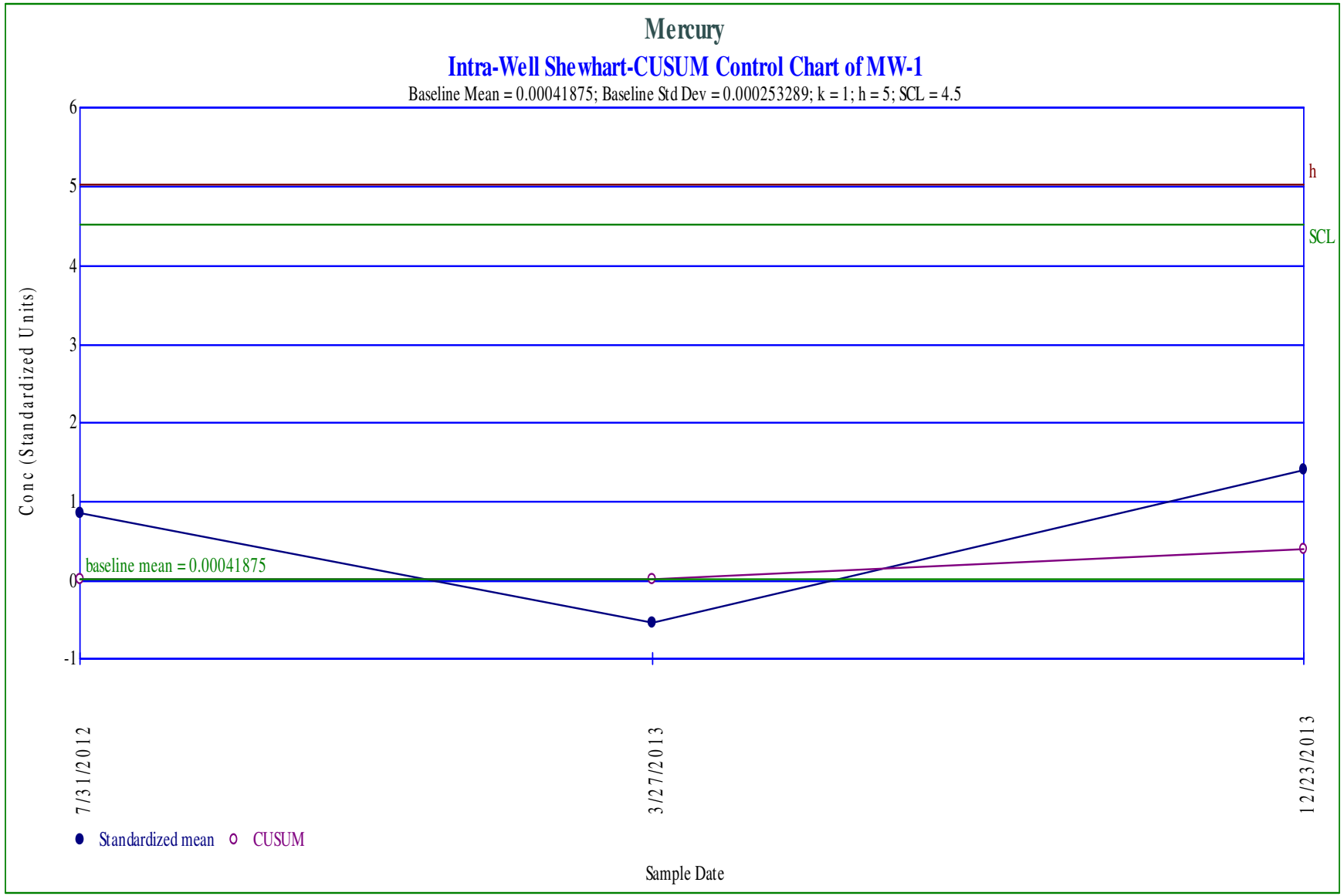
5% Critical value of 0.916 exceeds 0.754343
Evidence of non-normality at 95% level of significance

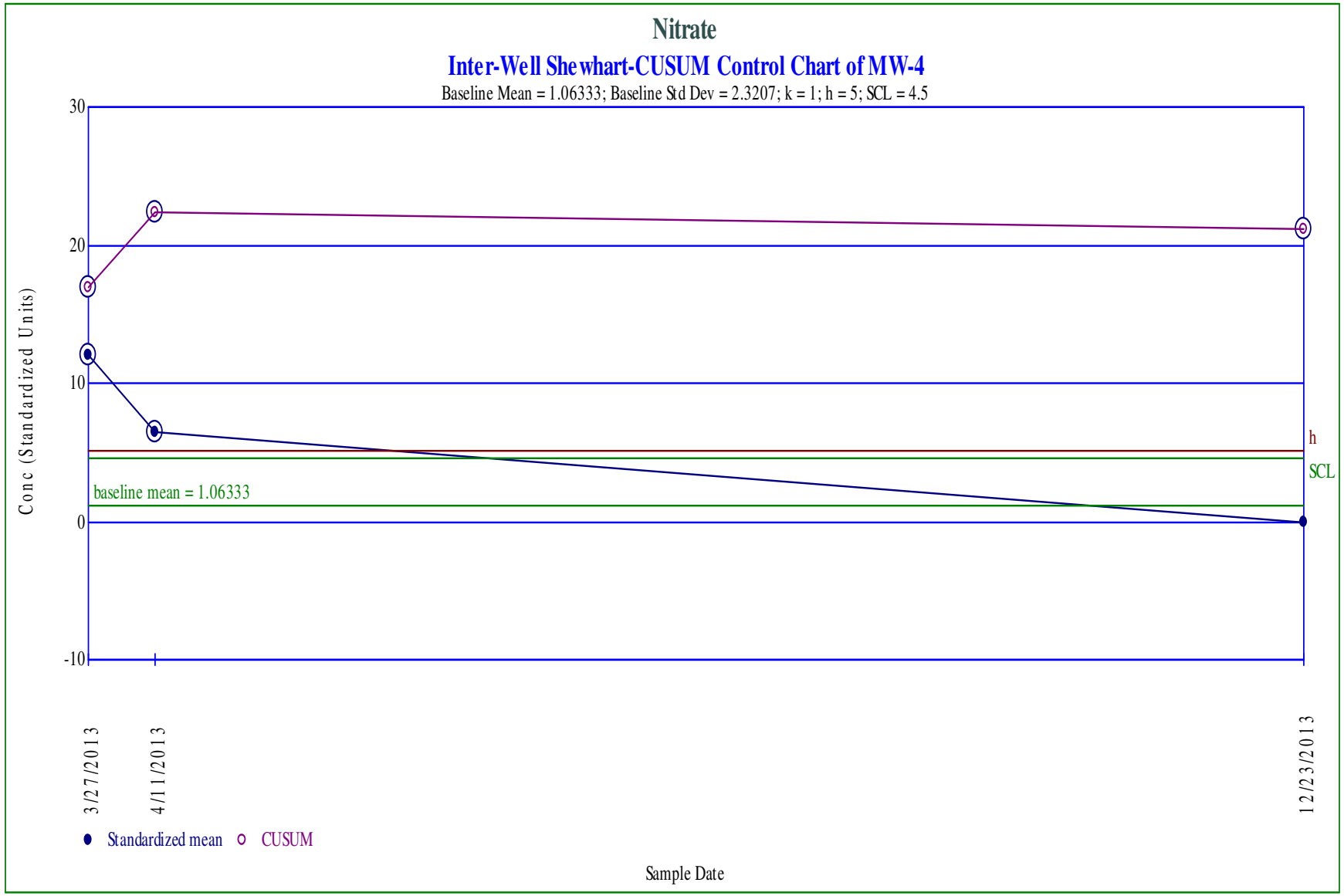
1% Critical value of 0.884 exceeds 0.754343
Evidence of non-normality at 99% level of significance

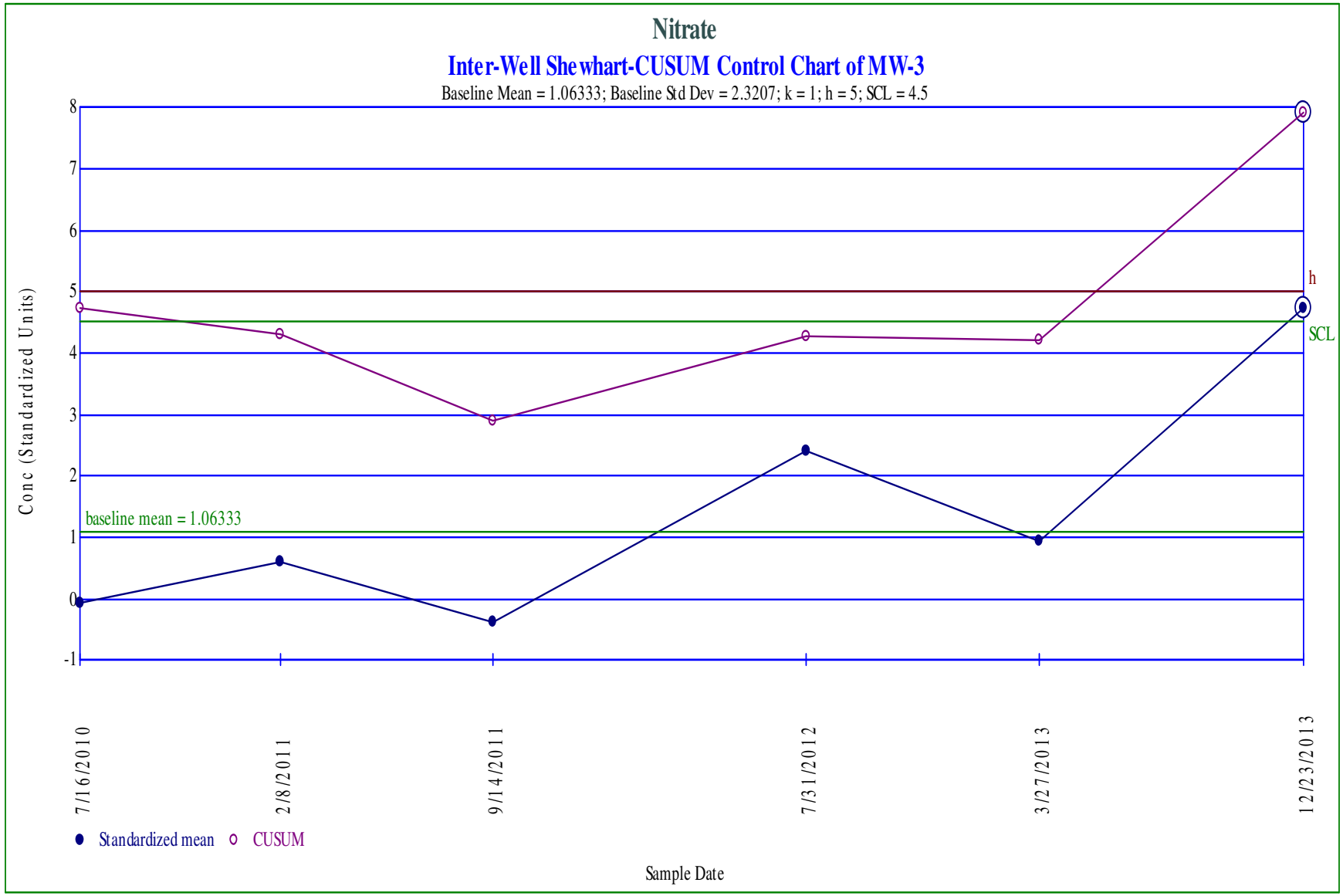

Barium
Intra-Well Shewhart-CUSUM Control Chart of MW-1
Baseline Mean = 0.038875; Baseline Std Dev = 0.0252555; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
6
5
4
3
2
1
0
-1
h
SCL
baseline mean = 0.038875
7/31/2012
3/27/2013
12/23/2013
Standardized mean
CUSUM
Sample Date

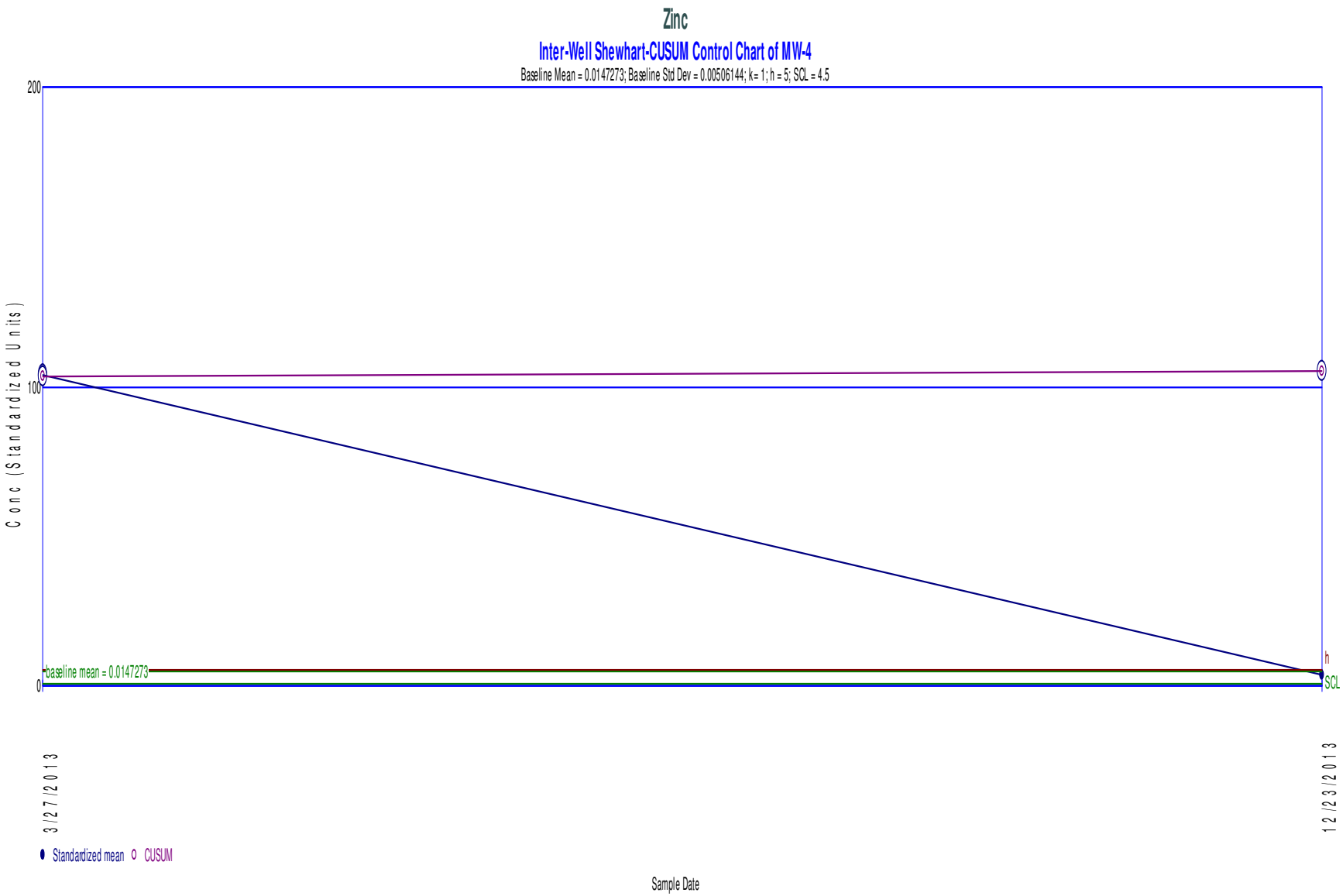

Chloride
Inter-Well Shewhart-CUSUM Control Chart of MW-4
Baseline Mean = 2.33636; Baseline Std Dev = 0.525876; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
800
700
600
500
400
300
200
100
0
baseline mean = 2.33636
h
SCL
3/27/2013
4/11/2013
12/23/2013
Standardized mean
CUSUM
Sample Date

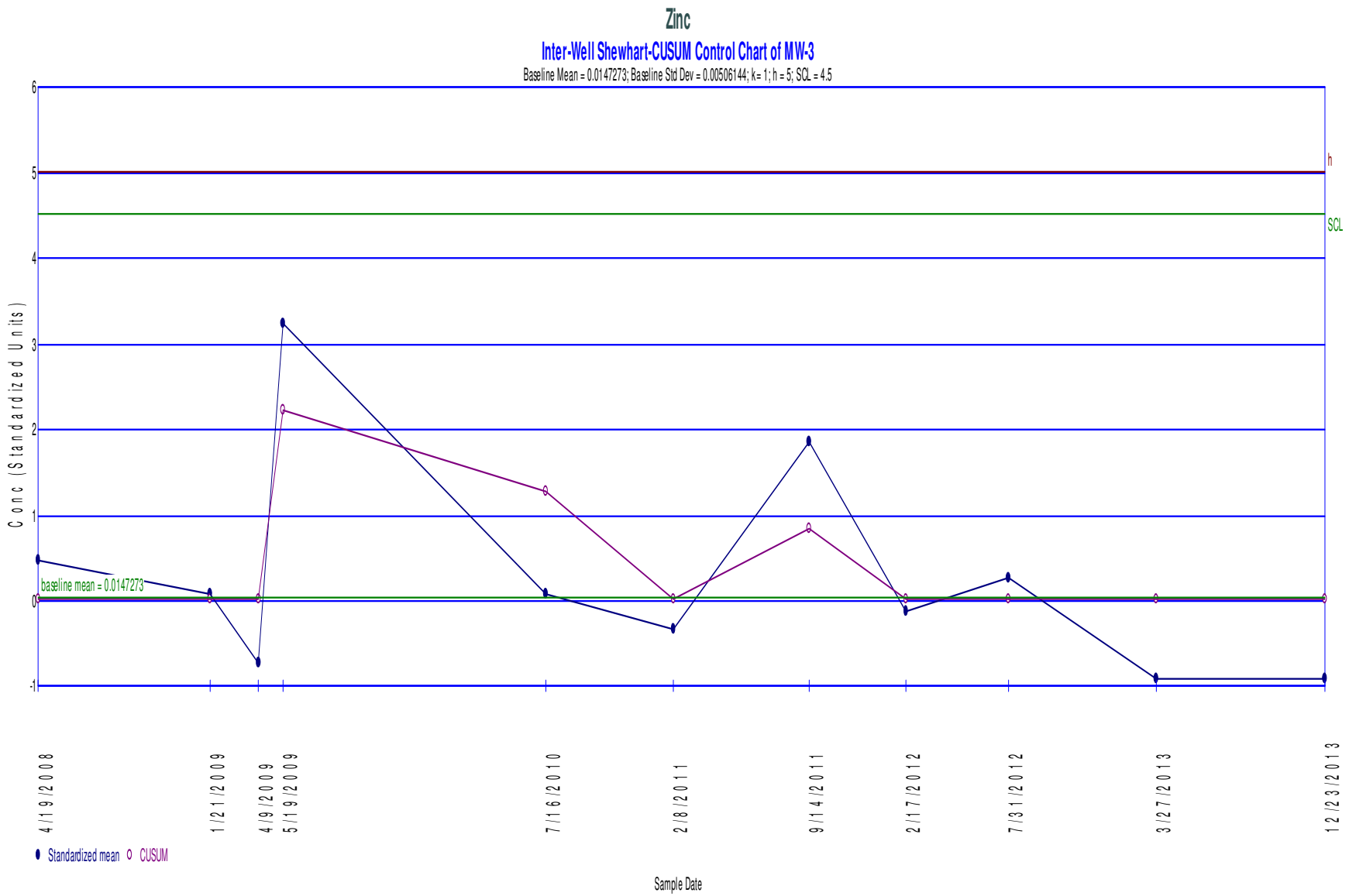

Chloride
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 2.33636; Baseline Std Dev = 0.525876; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
400
300
200
100
0
baseline mean = 2.33636
h
SCL
4/19/2008
1/21/2009
4/9/2009
5/19/2009
7/16/2010
2/8/2011
9/14/2011
2/17/2012
8/1/2012
3/27/2013
12/23/2013
Standardized mean
CUSUM
Sample Date


Mercury
Intra-Well Shewhart-CUSUM Control Chart of MW-1
Baseline Mean = 0.00041875; Baseline Std Dev = 0.000253289; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
6
5
4
3
2
1
0
-1
h
SCL
baseline mean = 0.00041875
7/31/2012
3/27/2013
12/23/2013
Standardized mean
CUSUM
Sample Date


Nitrate
Inter-Well Shewhart-CUSUM Control Chart of MW-4
Baseline Mean = 1.06333; Baseline Std Dev = 2.3207; k = 1; h = 5; SCL = 4.5
30
20
10
0
-10
Conc (Standardized Units)
h
SCL
baseline mean = 1.06333
3/27/2013
4/11/2013
12/23/2013
Standardized mean
CUSUM
Sample Date


Nitrate
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 1.06333; Baseline Std Dev = 2.3207; k = 1; h = 5; SCL = 4.5
Conc (Standardized Units)
8
7
6
5
4
3
2
1
0
-1
h
SCL
baseline mean = 1.06333
7/16/2010
2/8/2011
9/14/2011
7/31/2012
3/27/2013
12/23/2013
Standardized mean
CUSUM
Sample Date


Zinc
Inter-Well Shewhart-CUSUM Control Chart of MW-4
Baseline Mean = 0.0147273; Baseline Std Dev = 0.00506144; k= 1; h = 5; SCL = 4.5
200
100
0
Conc (Standardized Units)
baseline mean = 0.0147273
h
SCL
3/27/2013
12/23/2013
Standardized mean
CUSUM
Sample Date


Zinc
Inter-Well Shewhart-CUSUM Control Chart of MW-3
Baseline Mean = 0.0147273; Baseline Std Dev = 0.00506144; k= 1; h = 5; SCL = 4.5
h
SCL
baseline mean = 0.0147273
Conc (Standardized Units)
6
5
4
3
2
1
0
-1
4/19/2008
1/21/2009
4/9/2009
5/19/2009
7/16/2010
2/8/2011
9/14/2011
2/17/2012
7/31/2012
3/27/2013
12/23/2013
Standardized mean
CUSUM
Sample Date

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 66.6667%
Number of comparisons = 2
Future Samples (k) = 2
Recent Dates = 1
Background Measurements (n) = 11
Maximum Background Value = 0.0094
Confidence Level = 84.6%
False Positive Rate = 15.4%

Location	Date	Count	Mean	Significant
MW-3	12/23/2013	1	0.0016	FALSE
MW-4	12/23/2013	1	0.0014	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for MW-1

Parameter: Lead

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 80%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 10
Maximum Baseline Concentration = 0.0094
Confidence Level = 90.9%
False Positive Rate = 9.1%

Baseline Measurements	Date	Value
	4/19/2008	-0.005
	1/21/2009	0.0094
	4/9/2009	-0.001
	5/19/2009	-0.005
	7/16/2010	-0.001
	2/8/2011	-0.001
	9/14/2011	0.0038
	2/17/2012	-0.001
	7/31/2012	-0.001
	3/27/2013	-0.001

Date	Count	Mean	Significant
12/23/2013	1	0.0023	FALSE

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Aluminum

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 11
Background Mean = -0.910276
Background Std Dev = 1.57269

Number of comparisons = 2
Future Samples (k) = 2
Actual confidence level is 1.0 - (0.05/2) = 97.5 %
t is Percentile of Student's T-Test (0.95/2) = 0.975
Degrees of Freedom = 11 (background observations) - 1
t(0.975, 11) = 2.22814

Well MW-3

Date	Samples	Mean	Interval	Significant
12/23/2013	1	-2.04022	[0, 2.74972]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
12/23/2013	1	-2.99573	[0, 2.74972]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1

Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	4/19/2008	0.024
	1/21/2009	0.072
	4/9/2009	0.067
	5/19/2009	0.064
	7/16/2010	0.074
	2/8/2011	0.086
	9/14/2011	0.091
	2/17/2012	0.093
	7/31/2012	0.089
	3/27/2013	0.049

From 10 baseline samples
Baseline mean = 0.0709
Baseline std Dev = 0.0216048

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 10 (background observations) - 1
t(0.95, 10) = 1.83311

Date	Samples	Mean	Interval	Significant
12/23/2013	1	0.1	[0, 0.112437]	FALSE

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Barium

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 11
Background Mean = -3.5674
Background Std Dev = 0.547355

Number of comparisons = 2
Future Samples (k) = 2
Actual confidence level is 1.0 - (0.05/2) = 97.5 %
t is Percentile of Student's T-Test (0.95/2) = 0.975
Degrees of Freedom = 11 (background observations) - 1
t(0.975, 11) = 2.22814

Well MW-3

Date	Samples	Mean	Interval	Significant
12/23/2013	1	-1.89712	[0, -2.29359]	TRUE

Well MW-4

Date	Samples	Mean	Interval	Significant
12/23/2013	1	-4.64599	[0, -2.29359]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	4/19/2008	2
	1/21/2009	2.9
	4/9/2009	1.9
	5/19/2009	2.8
	7/16/2010	2.8
	2/8/2011	2.6
	9/14/2011	3.1
	2/17/2012	2.1
	7/31/2012	2.2
	3/27/2013	1.8

From 10 baseline samples
Baseline mean = 2.42
Baseline std Dev = 0.470933

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 10 (background observations) - 1
t(0.95, 10) = 1.83311

Date	Samples	Mean	Interval	Significant
12/23/2013	1	1.5	[0, 3.32541]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1

Parameter: Cobalt

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	4/19/2008	-3.44202
	1/21/2009	-3.50656
	4/9/2009	-3.14656
	5/19/2009	-2.8824
	7/16/2010	-3.35241
	2/8/2011	-3.47377
	9/14/2011	-3.54046
	2/17/2012	-3.64966
	7/31/2012	-3.57555
	3/27/2013	-3.32424

From 10 baseline samples
Baseline mean = -3.38936
Baseline std Dev = 0.228632

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 10 (background observations) - 1
t(0.95, 10) = 1.83311

Date	Samples	Mean	Interval	Significant
12/23/2013	1	-3.57555	[0, -2.9498]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1

Parameter: Mercury

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	4/19/2008	-0.0002
	1/21/2009	0.00045
	4/9/2009	-0.0002
	5/19/2009	-0.0002
	7/16/2010	0.0005
	2/8/2011	0.00024
	9/14/2011	0.00073
	2/17/2012	0.00083
	7/31/2012	0.00063
	3/27/2013	0.00028

From 10 baseline samples
Baseline mean = 0.000426
Baseline std Dev = 0.000238616

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 10 (background observations) - 1
t(0.95, 10) = 1.83311

Date	Samples	Mean	Interval	Significant
12/23/2013	1	0.00077	[0, 0.000884761]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	5/19/2009	8.9
	7/16/2010	9.4
	2/8/2011	5.8
	9/14/2011	6.6
	2/17/2012	-5
	7/31/2012	-5
	3/27/2013	5.1

From 7 baseline samples
Baseline mean = 6.54286
Baseline std Dev = 1.87604

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 7 (background observations) - 1
t(0.95, 7) = 1.94318

Date	Samples	Mean	Interval	Significant
12/23/2013	1	6.1	[0, 10.44]	FALSE

Parametric Prediction Interval Analysis

Inter-Well Comparison

Parameter: Sulfate

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Inter-Well Unified Guid. Formula 95% One-Sided Comparison

Background Samples = 8
Background Mean = 1.66772
Background Std Dev = 0.507621

Number of comparisons = 2
Future Samples (k) = 2
Actual confidence level is 1.0 - (0.05/2) = 97.5 %
t is Percentile of Student's T-Test (0.95/2) = 0.975
Degrees of Freedom = 8 (background observations) - 1
t(0.975, 8) = 2.36462

Well MW-3

Date	Samples	Mean	Interval	Significant
12/23/2013	1	2.48491	[0, 2.94087]	FALSE

Well MW-4

Date	Samples	Mean	Interval	Significant
12/23/2013	1	0.916291	[0, 2.94087]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for MW-1

Parameter: Zinc

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	4/19/2008	-4.50986
	1/21/2009	-4.19971
	4/9/2009	-4.50986
	5/19/2009	-3.86323
	7/16/2010	-4.50986
	2/8/2011	-4.13517
	9/14/2011	-3.81671
	2/17/2012	--5.29832
	7/31/2012	-3.77226
	3/27/2013	-4.42285

From 10 baseline samples
Baseline mean = -4.30378
Baseline std Dev = 0.457503

For 1 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/1) = 95 %
t is Percentile of Student's T-Test (0.95/1) = 0.95
Degrees of Freedom = 10 (background observations) - 1
t(0.95, 10) = 1.83311

Date	Samples	Mean	Interval	Significant
12/23/2013	1	-5.29832	[0, -3.42419]	FALSE

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Barium

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 0

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	0.084	17
	1/21/2009	0.028	7
	4/9/2009	0.028	8
	5/19/2009	0.033	9
	7/16/2010	0.021	4
	2/8/2011	0.021	5
	9/14/2011	0.074	16
	2/17/2012	0.022	6
	7/31/2012	0.019	3
	3/27/2013	0.018	2
	12/23/2013	0.017	1
MW-3	4/19/2008	0.056	15
	1/21/2009	0.039	10
	4/9/2009	0.043	11
	5/19/2009	0.047	12
	7/16/2010	0.055	14
	2/8/2011	0.052	13
	9/14/2011	0.15	21
	2/17/2012	0.097	20
	7/31/2012	0.091	18
	3/27/2013	0.094	19
	12/23/2013	0.15	22

The Wilcoxon Statistic is 109
The Expected value is is 60.5
The Standard Deviation is 15.2288
The Z Score is 3.15192
The Standard Deviation adjusted for ties is 15.2288
The Z Score adjusted for ties is 3.15192

3.15192 > 2.326 indicating statistical significance at 1% level

3.15192 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Barium

Location: MW-3

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

Total non detects is 0
Non detect rank is 0

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	-2.47694	17
	1/21/2009	-3.57555	7
	4/9/2009	-3.57555	8
	5/19/2009	-3.41125	9
	7/16/2010	-3.86323	4
	2/8/2011	-3.86323	5
	9/14/2011	-2.60369	16
	2/17/2012	-3.81671	6
	7/31/2012	-3.96332	3
	3/27/2013	-4.01738	2
	12/23/2013	-4.07454	1
MW-3	4/19/2008	-2.8824	15
	1/21/2009	-3.24419	10
	4/9/2009	-3.14656	11
	5/19/2009	-3.05761	12
	7/16/2010	-2.90042	14
	2/8/2011	-2.95651	13
	9/14/2011	-1.89712	21
	2/17/2012	-2.33304	20
	7/31/2012	-2.3969	18
	3/27/2013	-2.36446	19
	12/23/2013	-1.89712	22

The Wilcoxon Statistic is 109
The Expected value is is 60.5
The Standard Deviation is 15.2288
The Z Score is 3.15192
The Standard Deviation adjusted for ties is 15.2288
The Z Score adjusted for ties is 3.15192

3.15192 > 2.326 indicating statistical significance at 1% level

3.15192 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Chloride

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 0

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	2	4
	1/21/2009	2.9	10
	4/9/2009	1.9	3
	5/19/2009	2.8	8
	7/16/2010	2.8	9
	2/8/2011	2.6	7
	9/14/2011	3.1	11
	2/17/2012	2.1	5
	7/31/2012	2.2	6
	3/27/2013	1.8	2
	12/23/2013	1.5	1
MW-4	3/27/2013	270	14
	4/11/2013	150	13
	12/23/2013	6.4	12

The Wilcoxon Statistic is 33
The Expected value is is 16.5
The Standard Deviation is 6.42262
The Z Score is 2.4912
The Standard Deviation adjusted for ties is 6.42262
The Z Score adjusted for ties is 2.4912

2.4912 > 2.326 indicating statistical significance at 1% level

2.4912 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Chloride

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0
Non detect rank is 0

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	2	4
	1/21/2009	2.9	10
	4/9/2009	1.9	3
	5/19/2009	2.8	8
	7/16/2010	2.8	9
	2/8/2011	2.6	7
	9/14/2011	3.1	11
	2/17/2012	2.1	5
	7/31/2012	2.2	6
	3/27/2013	1.8	2
	12/23/2013	1.5	1
MW-3	4/19/2008	20	17
	1/21/2009	14	14
	4/9/2009	8.2	12
	5/19/2009	10	13
	7/16/2010	25	18
	2/8/2011	25	19
	9/14/2011	15	15
	2/17/2012	18	16
	8/1/2012	25	20
	3/27/2013	32	21
	12/23/2013	35	22

The Wilcoxon Statistic is 121
The Expected value is is 60.5
The Standard Deviation is 15.2288
The Z Score is 3.9399
The Standard Deviation adjusted for ties is 15.2288
The Z Score adjusted for ties is 3.9399

3.9399 > 2.326 indicating statistical significance at 1% level

3.9399 > 2.326 indicating statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Nitrate

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 4
Non detect rank is 2.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	7/16/2010	-0.1	2.5
	2/8/2011	5.8	7
	9/14/2011	-0.1	2.5
	7/31/2012	-0.1	2.5
	3/27/2013	0.18	5
	12/23/2013	-0.1	2.5
MW-4	3/27/2013	29	9
	4/11/2013	16	8
	12/23/2013	0.75	6

The Wilcoxon Statistic is 17
The Expected value is is 9
The Standard Deviation is 3.87298
The Z Score is 1.93649
The Standard Deviation adjusted for ties is 3.7081
The Z Score adjusted for ties is 2.0226
1.93649 < 2.326 indicating no statistical significance at 1% level
2.0226 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Nitrate

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 5
Non detect rank is 3

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	7/16/2010	-0.1	3
	2/8/2011	5.8	10
	9/14/2011	-0.1	3
	7/31/2012	-0.1	3
	3/27/2013	0.18	6
	12/23/2013	-0.1	3
MW-3	7/16/2010	0.87	7
	2/8/2011	2.4	8
	9/14/2011	-0.1	3
	7/31/2012	6.6	11
	3/27/2013	3.2	9
	12/23/2013	12	12

The Wilcoxon Statistic is 29
The Expected value is is 18
The Standard Deviation is 6.245
The Z Score is 1.68135
The Standard Deviation adjusted for ties is 6.02268
The Z Score adjusted for ties is 1.74341
1.68135 < 2.326 indicating no statistical significance at 1% level
1.74341 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Zinc

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 2
Non detect rank is 1.5

Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	0.011	3
	1/21/2009	0.015	7
	4/9/2009	0.011	4
	5/19/2009	0.021	9
	7/16/2010	0.011	5
	2/8/2011	0.016	8
	9/14/2011	0.022	10
	2/17/2012	ND<0.01	1.5
	7/31/2012	0.023	11
	3/27/2013	0.012	6
	12/23/2013	ND<0.01	1.5
MW-4	3/27/2013	0.54	13
	12/23/2013	0.031	12

The Wilcoxon Statistic is 22
The Expected value is is 11
The Standard Deviation is 5.06623
The Z Score is 2.07255
The Standard Deviation adjusted for ties is 5.05926
The Z Score adjusted for ties is 2.0754
2.07255 < 2.326 indicating no statistical significance at 1% level
2.0754 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

APPENDIX C

LABORATORY ANALYTICAL REPORT, FIELD INFORMATION LOGS

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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Mr. Michael Johnson
Civil & Environmental Consultants - TN
405 Duke Drive, Suite 270
Franklin, TN 37067

Report Summary

Tuesday January 07, 2014

Report Number: L675607
Samples Received: 12/24/13
Client Project: 101-301

Description: EWS - Camden

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: Jimmy Hunt

Jimmy Hunt , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-01

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : MW-1

Collected By : Mike Johnson
Collection Date : 12/23/13 12:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	1.5	1.0	mg/l	9056	12/24/13	1
Nitrate	BDL	0.10	mg/l	9056	12/24/13	1
Sulfate	6.1	5.0	mg/l	9056	12/24/13	1
Ammonia Nitrogen	0.10	0.10	mg/l	350.1	01/02/14	1
Antimony	BDL	0.0010	mg/l	6020	12/29/13	1
Arsenic	0.10	0.0010	mg/l	6020	12/29/13	1
Beryllium	BDL	0.0010	mg/l	6020	12/29/13	1
Cadmium	BDL	0.00050	mg/l	6020	12/29/13	1
Copper	BDL	0.0020	mg/l	6020	12/30/13	1
Lead	0.0023	0.0010	mg/l	6020	12/29/13	1
Selenium	BDL	0.0010	mg/l	6020	12/29/13	1
Thallium	BDL	0.0010	mg/l	6020	12/29/13	1
Zinc	BDL	0.010	mg/l	6020	12/29/13	1
Mercury	0.00077	0.00020	mg/l	7470A	12/27/13	1
Aluminum	BDL	0.10	mg/l	6010B	12/28/13	1
Barium	0.017	0.0050	mg/l	6010B	12/28/13	1
Boron	BDL	0.20	mg/l	6010B	12/28/13	1
Calcium	3.5	0.50	mg/l	6010B	12/28/13	1
Chromium	BDL	0.010	mg/l	6010B	12/28/13	1
Cobalt	0.028	0.010	mg/l	6010B	12/28/13	1
Iron	17.	0.10	mg/l	6010B	12/28/13	1
Magnesium	2.8	0.10	mg/l	6010B	12/28/13	1
Manganese	0.83	0.010	mg/l	6010B	12/28/13	1
Nickel	BDL	0.020	mg/l	6010B	12/28/13	1
Potassium	1.2	0.50	mg/l	6010B	12/28/13	1
Silver	BDL	0.010	mg/l	6010B	12/28/13	1
Sodium	6.0	0.50	mg/l	6010B	12/28/13	1
Vanadium	BDL	0.010	mg/l	6010B	12/28/13	1
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	01/02/14	1
Acrylonitrile	BDL	0.010	mg/l	8260B	01/02/14	1
Benzene	BDL	0.0010	mg/l	8260B	01/02/14	1
Bromochloromethane	BDL	0.0010	mg/l	8260B	01/02/14	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	01/02/14	1
Bromoform	BDL	0.0010	mg/l	8260B	01/02/14	1
Bromomethane	BDL	0.0050	mg/l	8260B	01/02/14	1
Carbon disulfide	BDL	0.0010	mg/l	8260B	01/02/14	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	01/02/14	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	01/02/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-01

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : MW-1

Collected By : Mike Johnson
Collection Date : 12/23/13 12:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	01/02/14	1
Chloroethane	BDL	0.0050	mg/l	8260B	01/02/14	1
Chloroform	BDL	0.0050	mg/l	8260B	01/02/14	1
Chloromethane	BDL	0.0025	mg/l	8260B	01/02/14	1
Dibromomethane	BDL	0.0010	mg/l	8260B	01/02/14	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/02/14	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/02/14	1
trans-1,4-Dichloro-2-butene	BDL	0.0025	mg/l	8260B	01/02/14	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	01/02/14	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	01/02/14	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	01/02/14	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/02/14	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/02/14	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	01/02/14	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/02/14	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/02/14	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	01/02/14	1
2-Hexanone	BDL	0.010	mg/l	8260B	01/02/14	1
Iodomethane	BDL	0.010	mg/l	8260B	01/02/14	1
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	01/02/14	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	01/02/14	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	01/02/14	1
Styrene	BDL	0.0010	mg/l	8260B	01/02/14	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/02/14	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/02/14	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	01/02/14	1
Toluene	BDL	0.0050	mg/l	8260B	01/02/14	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	01/02/14	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	01/02/14	1
Trichloroethene	BDL	0.0010	mg/l	8260B	01/02/14	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	01/02/14	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	01/02/14	1
Vinyl acetate	BDL	0.010	mg/l	8260B	01/02/14	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	01/02/14	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	01/02/14	1
Surrogate Recovery						
Toluene-d8	102.		% Rec.	8260B	01/02/14	1
Dibromofluoromethane	99.1		% Rec.	8260B	01/02/14	1
a,a,a-Trifluorotoluene	106.		% Rec.	8260B	01/02/14	1
4-Bromofluorobenzene	101.		% Rec.	8260B	01/02/14	1
Ethylene Dibromide	BDL	0.000010	mg/l	8011	12/30/13	1
1,2-Dibromo-3-Chloropropane	BDL	0.000020	mg/l	8011	12/30/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 01/06/14 12:06 Revised: 01/07/14 13:04

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-02

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : MW-3

Collected By : Mike Johnson
Collection Date : 12/23/13 14:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	35.	5.0	mg/l	9056	12/24/13	5
Nitrate	12.	0.50	mg/l	9056	12/24/13	5
Sulfate	12.	5.0	mg/l	9056	01/07/14	1
Ammonia Nitrogen	1.9	0.10	mg/l	350.1	01/02/14	1
Antimony	BDL	0.0010	mg/l	6020	12/29/13	1
Arsenic	BDL	0.0010	mg/l	6020	12/29/13	1
Beryllium	BDL	0.0010	mg/l	6020	12/29/13	1
Cadmium	BDL	0.00050	mg/l	6020	12/29/13	1
Copper	BDL	0.0020	mg/l	6020	12/30/13	1
Lead	0.0016	0.0010	mg/l	6020	12/29/13	1
Selenium	BDL	0.0010	mg/l	6020	12/29/13	1
Thallium	BDL	0.0010	mg/l	6020	12/29/13	1
Zinc	BDL	0.010	mg/l	6020	12/29/13	1
Mercury	BDL	0.00020	mg/l	7470A	12/27/13	1
Aluminum	0.13	0.10	mg/l	6010B	12/28/13	1
Barium	0.15	0.0050	mg/l	6010B	12/28/13	1
Boron	BDL	0.20	mg/l	6010B	12/28/13	1
Calcium	15.	0.50	mg/l	6010B	12/28/13	1
Chromium	BDL	0.010	mg/l	6010B	12/28/13	1
Cobalt	BDL	0.010	mg/l	6010B	12/28/13	1
Iron	BDL	0.10	mg/l	6010B	12/28/13	1
Magnesium	5.3	0.10	mg/l	6010B	12/28/13	1
Manganese	0.40	0.010	mg/l	6010B	12/28/13	1
Nickel	BDL	0.020	mg/l	6010B	12/28/13	1
Potassium	10.	0.50	mg/l	6010B	12/28/13	1
Silver	BDL	0.010	mg/l	6010B	12/28/13	1
Sodium	21.	0.50	mg/l	6010B	12/28/13	1
Vanadium	BDL	0.010	mg/l	6010B	12/28/13	1
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	01/04/14	1
Acrylonitrile	BDL	0.010	mg/l	8260B	01/04/14	1
Benzene	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromochloromethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromoform	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromomethane	BDL	0.0050	mg/l	8260B	01/04/14	1
Carbon disulfide	BDL	0.0010	mg/l	8260B	01/04/14	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	01/04/14	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	01/04/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-02

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : MW-3

Collected By : Mike Johnson
Collection Date : 12/23/13 14:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Chloroethane	BDL	0.0050	mg/l	8260B	01/04/14	1
Chloroform	BDL	0.0050	mg/l	8260B	01/04/14	1
Chloromethane	BDL	0.0025	mg/l	8260B	01/04/14	1
Dibromomethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/04/14	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/04/14	1
trans-1,4-Dichloro-2-butene	BDL	0.0025	mg/l	8260B	01/04/14	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	01/04/14	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/04/14	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/04/14	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	01/04/14	1
2-Hexanone	BDL	0.010	mg/l	8260B	01/04/14	1
Iodomethane	BDL	0.010	mg/l	8260B	01/04/14	1
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	01/04/14	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	01/04/14	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	01/04/14	1
Styrene	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
Toluene	BDL	0.0050	mg/l	8260B	01/04/14	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Trichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	01/04/14	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	01/04/14	1
Vinyl acetate	BDL	0.010	mg/l	8260B	01/04/14	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	01/04/14	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	01/04/14	1
Surrogate Recovery						
Toluene-d8	104.		% Rec.	8260B	01/04/14	1
Dibromofluoromethane	98.2		% Rec.	8260B	01/04/14	1
a,a,a-Trifluorotoluene	104.		% Rec.	8260B	01/04/14	1
4-Bromofluorobenzene	103.		% Rec.	8260B	01/04/14	1
Ethylene Dibromide	BDL	0.000010	mg/l	8011	12/30/13	1
1,2-Dibromo-3-Chloropropane	BDL	0.000020	mg/l	8011	12/30/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 01/06/14 12:06 Revised: 01/07/14 13:04

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-03

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : MW-4

Collected By : Mike Johnson
Collection Date : 12/23/13 13:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	6.4	1.0	mg/l	9056	12/24/13	1
Nitrate	0.75	0.10	mg/l	9056	12/24/13	1
Sulfate	BDL	5.0	mg/l	9056	12/24/13	1
Ammonia Nitrogen	0.12	0.10	mg/l	350.1	01/02/14	1
Antimony	BDL	0.0010	mg/l	6020	12/29/13	1
Arsenic	BDL	0.0010	mg/l	6020	12/29/13	1
Beryllium	BDL	0.0010	mg/l	6020	12/29/13	1
Cadmium	BDL	0.00050	mg/l	6020	12/29/13	1
Copper	BDL	0.0020	mg/l	6020	12/30/13	1
Lead	0.0014	0.0010	mg/l	6020	12/29/13	1
Selenium	BDL	0.0010	mg/l	6020	12/29/13	1
Thallium	BDL	0.0010	mg/l	6020	12/29/13	1
Zinc	0.031	0.010	mg/l	6020	12/29/13	1
Mercury	BDL	0.00020	mg/l	7470A	12/27/13	1
Aluminum	BDL	0.10	mg/l	6010B	12/28/13	1
Barium	0.0096	0.0050	mg/l	6010B	12/28/13	1
Boron	BDL	0.20	mg/l	6010B	12/28/13	1
Calcium	2.8	0.50	mg/l	6010B	12/28/13	1
Chromium	BDL	0.010	mg/l	6010B	12/28/13	1
Cobalt	BDL	0.010	mg/l	6010B	12/28/13	1
Iron	BDL	0.10	mg/l	6010B	12/28/13	1
Magnesium	1.8	0.10	mg/l	6010B	12/28/13	1
Manganese	0.26	0.010	mg/l	6010B	12/28/13	1
Nickel	BDL	0.020	mg/l	6010B	12/28/13	1
Potassium	1.5	0.50	mg/l	6010B	12/28/13	1
Silver	BDL	0.010	mg/l	6010B	12/28/13	1
Sodium	5.3	0.50	mg/l	6010B	12/28/13	1
Vanadium	BDL	0.010	mg/l	6010B	12/28/13	1
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	01/04/14	1
Acrylonitrile	BDL	0.010	mg/l	8260B	01/04/14	1
Benzene	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromochloromethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromoform	BDL	0.0010	mg/l	8260B	01/04/14	1
Bromomethane	BDL	0.0050	mg/l	8260B	01/04/14	1
Carbon disulfide	BDL	0.0010	mg/l	8260B	01/04/14	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	01/04/14	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	01/04/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-03

Date Received : December 24, 2013
Description : EWS - Camden

Site ID :

Sample ID : MW-4

Project # : 101-301

Collected By : Mike Johnson
Collection Date : 12/23/13 13:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Chloroethane	BDL	0.0050	mg/l	8260B	01/04/14	1
Chloroform	BDL	0.0050	mg/l	8260B	01/04/14	1
Chloromethane	BDL	0.0025	mg/l	8260B	01/04/14	1
Dibromomethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/04/14	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/04/14	1
trans-1,4-Dichloro-2-butene	BDL	0.0025	mg/l	8260B	01/04/14	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	01/04/14	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/04/14	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/04/14	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	01/04/14	1
2-Hexanone	BDL	0.010	mg/l	8260B	01/04/14	1
Iodomethane	BDL	0.010	mg/l	8260B	01/04/14	1
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	01/04/14	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	01/04/14	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	01/04/14	1
Styrene	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
Toluene	BDL	0.0050	mg/l	8260B	01/04/14	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	01/04/14	1
Trichloroethene	BDL	0.0010	mg/l	8260B	01/04/14	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	01/04/14	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	01/04/14	1
Vinyl acetate	BDL	0.010	mg/l	8260B	01/04/14	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	01/04/14	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	01/04/14	1
Surrogate Recovery						
Toluene-d8	102.		% Rec.	8260B	01/04/14	1
Dibromofluoromethane	103.		% Rec.	8260B	01/04/14	1
a,a,a-Trifluorotoluene	106.		% Rec.	8260B	01/04/14	1
4-Bromofluorobenzene	100.		% Rec.	8260B	01/04/14	1
Ethylene Dibromide	BDL	0.000010	mg/l	8011	12/30/13	1
1,2-Dibromo-3-Chloropropane	BDL	0.000020	mg/l	8011	12/30/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 01/06/14 12:06 Revised: 01/07/14 13:04

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Est. 1970

REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-04

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : DUPLICATE

Collected By : Mike Johnson
Collection Date : 12/23/13 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	6.2	1.0	mg/l	9056	12/24/13	1
Nitrate	0.76	0.10	mg/l	9056	12/24/13	1
Sulfate	BDL	5.0	mg/l	9056	12/24/13	1
Ammonia Nitrogen	BDL	0.10	mg/l	350.1	01/02/14	1
Antimony	BDL	0.0010	mg/l	6020	12/29/13	1
Arsenic	BDL	0.0010	mg/l	6020	12/29/13	1
Beryllium	BDL	0.0010	mg/l	6020	12/29/13	1
Cadmium	BDL	0.00050	mg/l	6020	12/29/13	1
Copper	BDL	0.0020	mg/l	6020	12/30/13	1
Lead	BDL	0.0010	mg/l	6020	12/29/13	1
Selenium	BDL	0.0010	mg/l	6020	12/29/13	1
Thallium	BDL	0.0010	mg/l	6020	12/29/13	1
Zinc	0.029	0.010	mg/l	6020	12/29/13	1
Mercury	BDL	0.00020	mg/l	7470A	12/27/13	1
Aluminum	BDL	0.10	mg/l	6010B	12/28/13	1
Barium	0.0098	0.0050	mg/l	6010B	12/28/13	1
Boron	BDL	0.20	mg/l	6010B	12/28/13	1
Calcium	2.8	0.50	mg/l	6010B	12/28/13	1
Chromium	BDL	0.010	mg/l	6010B	12/28/13	1
Cobalt	BDL	0.010	mg/l	6010B	12/28/13	1
Iron	BDL	0.10	mg/l	6010B	12/28/13	1
Magnesium	1.8	0.10	mg/l	6010B	12/28/13	1
Manganese	0.26	0.010	mg/l	6010B	12/28/13	1
Nickel	BDL	0.020	mg/l	6010B	12/28/13	1
Potassium	1.4	0.50	mg/l	6010B	12/28/13	1
Silver	BDL	0.010	mg/l	6010B	12/28/13	1
Sodium	5.1	0.50	mg/l	6010B	12/28/13	1
Vanadium	BDL	0.010	mg/l	6010B	12/28/13	1
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	01/03/14	1
Acrylonitrile	BDL	0.010	mg/l	8260B	01/03/14	1
Benzene	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromochloromethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromoform	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromomethane	BDL	0.0050	mg/l	8260B	01/03/14	1
Carbon disulfide	BDL	0.0010	mg/l	8260B	01/03/14	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	01/03/14	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	01/03/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-04

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : DUPLICATE

Collected By : Mike Johnson
Collection Date : 12/23/13 00:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Chloroethane	BDL	0.0050	mg/l	8260B	01/03/14	1
Chloroform	BDL	0.0050	mg/l	8260B	01/03/14	1
Chloromethane	BDL	0.0025	mg/l	8260B	01/03/14	1
Dibromomethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/03/14	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/03/14	1
trans-1,4-Dichloro-2-butene	BDL	0.0025	mg/l	8260B	01/03/14	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	01/03/14	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/03/14	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/03/14	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	01/03/14	1
2-Hexanone	BDL	0.010	mg/l	8260B	01/03/14	1
Iodomethane	BDL	0.010	mg/l	8260B	01/03/14	1
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	01/03/14	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	01/03/14	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	01/03/14	1
Styrene	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
Toluene	BDL	0.0050	mg/l	8260B	01/03/14	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Trichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	01/03/14	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	01/03/14	1
Vinyl acetate	BDL	0.010	mg/l	8260B	01/03/14	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	01/03/14	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	01/03/14	1
Surrogate Recovery						
Toluene-d8	97.8		% Rec.	8260B	01/03/14	1
Dibromofluoromethane	89.3		% Rec.	8260B	01/03/14	1
a,a,a-Trifluorotoluene	96.6		% Rec.	8260B	01/03/14	1
4-Bromofluorobenzene	89.7		% Rec.	8260B	01/03/14	1
Ethylene Dibromide	BDL	0.000010	mg/l	8011	12/30/13	1
1,2-Dibromo-3-Chloropropane	BDL	0.000020	mg/l	8011	12/30/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 01/06/14 12:06 Revised: 01/07/14 13:04

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

ESC Sample # : L675607-05

Site ID :

Project # : 101-301

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : FIELD BLANK

Collected By : Mike Johnson
Collection Date : 12/23/13 13:45

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chloride	BDL	1.0	mg/l	9056	12/24/13	1
Nitrate	BDL	0.10	mg/l	9056	12/24/13	1
Sulfate	BDL	5.0	mg/l	9056	12/24/13	1
Ammonia Nitrogen	BDL	0.10	mg/l	350.1	01/02/14	1
Antimony	BDL	0.0010	mg/l	6020	12/29/13	1
Arsenic	BDL	0.0010	mg/l	6020	12/29/13	1
Beryllium	BDL	0.0010	mg/l	6020	12/29/13	1
Cadmium	BDL	0.00050	mg/l	6020	12/29/13	1
Copper	BDL	0.0020	mg/l	6020	12/30/13	1
Lead	BDL	0.0010	mg/l	6020	12/29/13	1
Selenium	BDL	0.0010	mg/l	6020	12/29/13	1
Thallium	BDL	0.0010	mg/l	6020	12/29/13	1
Zinc	BDL	0.010	mg/l	6020	12/29/13	1
Mercury	BDL	0.00020	mg/l	7470A	12/27/13	1
Aluminum	BDL	0.10	mg/l	6010B	12/28/13	1
Barium	BDL	0.0050	mg/l	6010B	12/28/13	1
Boron	BDL	0.20	mg/l	6010B	12/28/13	1
Calcium	BDL	0.50	mg/l	6010B	12/28/13	1
Chromium	BDL	0.010	mg/l	6010B	12/28/13	1
Cobalt	BDL	0.010	mg/l	6010B	12/28/13	1
Iron	BDL	0.10	mg/l	6010B	12/28/13	1
Magnesium	BDL	0.10	mg/l	6010B	12/28/13	1
Manganese	BDL	0.010	mg/l	6010B	12/28/13	1
Nickel	BDL	0.020	mg/l	6010B	12/28/13	1
Potassium	BDL	0.50	mg/l	6010B	12/28/13	1
Silver	BDL	0.010	mg/l	6010B	12/28/13	1
Sodium	BDL	0.50	mg/l	6010B	12/28/13	1
Vanadium	BDL	0.010	mg/l	6010B	12/28/13	1
Volatile Organics						
Acetone	BDL	0.050	mg/l	8260B	01/03/14	1
Acrylonitrile	BDL	0.010	mg/l	8260B	01/03/14	1
Benzene	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromochloromethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromodichloromethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromoform	BDL	0.0010	mg/l	8260B	01/03/14	1
Bromomethane	BDL	0.0050	mg/l	8260B	01/03/14	1
Carbon disulfide	BDL	0.0010	mg/l	8260B	01/03/14	1
Carbon tetrachloride	BDL	0.0010	mg/l	8260B	01/03/14	1
Chlorobenzene	BDL	0.0010	mg/l	8260B	01/03/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)

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REPORT OF ANALYSIS

Mr. Michael Johnson
Civil & Environmental Consultants -
405 Duke Drive, Suite 270
Franklin, TN 37067

January 07, 2014

Date Received : December 24, 2013
Description : EWS - Camden

Sample ID : FIELD BLANK

Collected By : Mike Johnson
Collection Date : 12/23/13 13:45

ESC Sample # : L675607-05

Site ID :

Project # : 101-301

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chlorodibromomethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Chloroethane	BDL	0.0050	mg/l	8260B	01/03/14	1
Chloroform	BDL	0.0050	mg/l	8260B	01/03/14	1
Chloromethane	BDL	0.0025	mg/l	8260B	01/03/14	1
Dibromomethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,2-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/03/14	1
1,4-Dichlorobenzene	BDL	0.0010	mg/l	8260B	01/03/14	1
trans-1,4-Dichloro-2-butene	BDL	0.0025	mg/l	8260B	01/03/14	1
1,1-Dichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,2-Dichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1-Dichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
cis-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
trans-1,2-Dichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
1,2-Dichloropropane	BDL	0.0010	mg/l	8260B	01/03/14	1
cis-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/03/14	1
trans-1,3-Dichloropropene	BDL	0.0010	mg/l	8260B	01/03/14	1
Ethylbenzene	BDL	0.0010	mg/l	8260B	01/03/14	1
2-Hexanone	BDL	0.010	mg/l	8260B	01/03/14	1
Iodomethane	BDL	0.010	mg/l	8260B	01/03/14	1
2-Butanone (MEK)	BDL	0.010	mg/l	8260B	01/03/14	1
Methylene Chloride	BDL	0.0050	mg/l	8260B	01/03/14	1
4-Methyl-2-pentanone (MIBK)	BDL	0.010	mg/l	8260B	01/03/14	1
Styrene	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1,1,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1,2,2-Tetrachloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Tetrachloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
Toluene	BDL	0.0050	mg/l	8260B	01/03/14	1
1,1,1-Trichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
1,1,2-Trichloroethane	BDL	0.0010	mg/l	8260B	01/03/14	1
Trichloroethene	BDL	0.0010	mg/l	8260B	01/03/14	1
Trichlorofluoromethane	BDL	0.0050	mg/l	8260B	01/03/14	1
1,2,3-Trichloropropane	BDL	0.0025	mg/l	8260B	01/03/14	1
Vinyl acetate	BDL	0.010	mg/l	8260B	01/03/14	1
Vinyl chloride	BDL	0.0010	mg/l	8260B	01/03/14	1
Xylenes, Total	BDL	0.0030	mg/l	8260B	01/03/14	1
Surrogate Recovery						
Toluene-d8	97.5		% Rec.	8260B	01/03/14	1
Dibromofluoromethane	95.9		% Rec.	8260B	01/03/14	1
a,a,a-Trifluorotoluene	101.		% Rec.	8260B	01/03/14	1
4-Bromofluorobenzene	86.4		% Rec.	8260B	01/03/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.

.
Reported: 01/06/14 12:06 Revised: 01/07/14 13:04

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L675607-04	WG699945	SAMP	Acetone	R2873580	J4
L675607-05	WG699945	SAMP	Acetone	R2873580	J4

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J4	The associated batch QC was outside the established quality control range for accuracy.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

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Civil & Environmental Consultants - TN
Mr. Michael Johnson
405 Duke Drive, Suite 270
Franklin, TN 37067

Quality Assurance Report
Level II

L675607

January 07, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Chloride	< 1	mg/l			WG697964	12/24/13 08:24
Nitrate	< .1	mg/l			WG697964	12/24/13 08:24
Sulfate	< 5	mg/l			WG697964	12/24/13 08:24
Mercury	< .0002	mg/l			WG699123	12/27/13 10:57
Aluminum	< .1	mg/l			WG699290	12/28/13 09:19
Barium	< .005	mg/l			WG699290	12/28/13 09:19
Boron	< .2	mg/l			WG699290	12/28/13 09:19
Calcium	< .5	mg/l			WG699290	12/28/13 09:19
Chromium	< .01	mg/l			WG699290	12/28/13 09:19
Cobalt	< .01	mg/l			WG699290	12/28/13 09:19
Iron	< .1	mg/l			WG699290	12/28/13 09:19
Magnesium	< .1	mg/l			WG699290	12/28/13 09:19
Manganese	< .01	mg/l			WG699290	12/28/13 09:19
Nickel	< .02	mg/l			WG699290	12/28/13 09:19
Potassium	< .5	mg/l			WG699290	12/28/13 09:19
Silver	< .01	mg/l			WG699290	12/28/13 09:19
Sodium	< .5	mg/l			WG699290	12/28/13 09:19
Vanadium	< .01	mg/l			WG699290	12/28/13 09:19
Antimony	< .001	mg/l			WG699283	12/29/13 15:17
Arsenic	< .001	mg/l			WG699283	12/29/13 15:17
Beryllium	< .001	mg/l			WG699283	12/29/13 15:17
Cadmium	< .0005	mg/l			WG699283	12/29/13 15:17
Lead	< .001	mg/l			WG699283	12/29/13 15:17
Selenium	< .001	mg/l			WG699283	12/29/13 15:17
Thallium	< .001	mg/l			WG699283	12/29/13 15:17
Zinc	< .01	mg/l			WG699283	12/29/13 15:17
1,2-Dibromo-3-Chloropropane	< .00002	mg/l			WG699589	12/30/13 17:06
Ethylene Dibromide	< .00001	mg/l			WG699589	12/30/13 17:06
1,1,1,2-Tetrachloroethane		% Rec.	81.00	60-140	WG699589	12/30/13 17:06
Copper	< .002	mg/l			WG699576	12/30/13 18:37
1,1,1,2-Tetrachloroethane	< .001	mg/l			WG699441	01/02/14 15:11
1,1,1-Trichloroethane	< .001	mg/l			WG699441	01/02/14 15:11
1,1,2,2-Tetrachloroethane	< .001	mg/l			WG699441	01/02/14 15:11
1,1,2-Trichloroethane	< .001	mg/l			WG699441	01/02/14 15:11
1,1-Dichloroethane	< .001	mg/l			WG699441	01/02/14 15:11
1,1-Dichloroethene	< .001	mg/l			WG699441	01/02/14 15:11
1,2,3-Trichloropropane	< .001	mg/l			WG699441	01/02/14 15:11
1,2-Dichlorobenzene	< .001	mg/l			WG699441	01/02/14 15:11
1,2-Dichloroethane	< .001	mg/l			WG699441	01/02/14 15:11
1,2-Dichloropropane	< .001	mg/l			WG699441	01/02/14 15:11
1,4-Dichlorobenzene	< .001	mg/l			WG699441	01/02/14 15:11
2-Butanone (MEK)	< .01	mg/l			WG699441	01/02/14 15:11
2-Hexanone	< .01	mg/l			WG699441	01/02/14 15:11
4-Methyl-2-pentanone (MIBK)	< .01	mg/l			WG699441	01/02/14 15:11
Acetone	< .05	mg/l			WG699441	01/02/14 15:11
Acrylonitrile	< .01	mg/l			WG699441	01/02/14 15:11
Benzene	< .001	mg/l			WG699441	01/02/14 15:11

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Civil & Environmental Consultants - TN
Mr. Michael Johnson
405 Duke Drive, Suite 270
Franklin, TN 37067

Quality Assurance Report
Level II

L675607

January 07, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Bromochloromethane	< .001	mg/l			WG699441	01/02/14 15:11
Bromodichloromethane	< .001	mg/l			WG699441	01/02/14 15:11
Bromoform	< .001	mg/l			WG699441	01/02/14 15:11
Bromomethane	< .005	mg/l			WG699441	01/02/14 15:11
Carbon disulfide	< .001	mg/l			WG699441	01/02/14 15:11
Carbon tetrachloride	< .001	mg/l			WG699441	01/02/14 15:11
Chlorobenzene	< .001	mg/l			WG699441	01/02/14 15:11
Chlorodibromomethane	< .001	mg/l			WG699441	01/02/14 15:11
Chloroethane	< .005	mg/l			WG699441	01/02/14 15:11
Chloroform	< .005	mg/l			WG699441	01/02/14 15:11
Chloromethane	< .0025	mg/l			WG699441	01/02/14 15:11
cis-1,2-Dichloroethene	< .001	mg/l			WG699441	01/02/14 15:11
cis-1,3-Dichloropropene	< .001	mg/l			WG699441	01/02/14 15:11
Dibromomethane	< .001	mg/l			WG699441	01/02/14 15:11
Ethylbenzene	< .001	mg/l			WG699441	01/02/14 15:11
Iodomethane	< .01	mg/l			WG699441	01/02/14 15:11
Methylene Chloride	< .005	mg/l			WG699441	01/02/14 15:11
Styrene	< .001	mg/l			WG699441	01/02/14 15:11
Tetrachloroethene	< .001	mg/l			WG699441	01/02/14 15:11
Toluene	< .005	mg/l			WG699441	01/02/14 15:11
trans-1,2-Dichloroethene	< .001	mg/l			WG699441	01/02/14 15:11
trans-1,3-Dichloropropene	< .001	mg/l			WG699441	01/02/14 15:11
trans-1,4-Dichloro-2-butene	< .0025	mg/l			WG699441	01/02/14 15:11
Trichloroethene	< .001	mg/l			WG699441	01/02/14 15:11
Trichlorofluoromethane	< .005	mg/l			WG699441	01/02/14 15:11
Vinyl acetate	< .01	mg/l			WG699441	01/02/14 15:11
Vinyl chloride	< .001	mg/l			WG699441	01/02/14 15:11
Xylenes, Total	< .003	mg/l			WG699441	01/02/14 15:11
4-Bromofluorobenzene		% Rec.	101.0	71-126	WG699441	01/02/14 15:11
Dibromofluoromethane		% Rec.	98.40	78.3-121	WG699441	01/02/14 15:11
Toluene-d8		% Rec.	101.0	88.5-111	WG699441	01/02/14 15:11
a,a,a-Trifluorotoluene		% Rec.	104.0	85-114	WG699441	01/02/14 15:11
Ammonia Nitrogen	< .1	mg/l			WG699916	01/02/14 22:34
1,1,1,2-Tetrachloroethane	< .001	mg/l			WG699945	01/03/14 03:54
1,1,1-Trichloroethane	< .001	mg/l			WG699945	01/03/14 03:54
1,1,2,2-Tetrachloroethane	< .001	mg/l			WG699945	01/03/14 03:54
1,1,2-Trichloroethane	< .001	mg/l			WG699945	01/03/14 03:54
1,1-Dichloroethane	< .001	mg/l			WG699945	01/03/14 03:54
1,1-Dichloroethene	< .001	mg/l			WG699945	01/03/14 03:54
1,2,3-Trichloropropane	< .001	mg/l			WG699945	01/03/14 03:54
1,2-Dichlorobenzene	< .001	mg/l			WG699945	01/03/14 03:54
1,2-Dichloroethane	< .001	mg/l			WG699945	01/03/14 03:54
1,2-Dichloropropane	< .001	mg/l			WG699945	01/03/14 03:54
1,4-Dichlorobenzene	< .001	mg/l			WG699945	01/03/14 03:54
2-Butanone (MEK)	< .01	mg/l			WG699945	01/03/14 03:54
2-Hexanone	< .01	mg/l			WG699945	01/03/14 03:54
4-Methyl-2-pentanone (MIBK)	< .01	mg/l			WG699945	01/03/14 03:54
Acetone	< .05	mg/l			WG699945	01/03/14 03:54
Acrylonitrile	< .01	mg/l			WG699945	01/03/14 03:54
Benzene	< .001	mg/l			WG699945	01/03/14 03:54
Bromochloromethane	< .001	mg/l			WG699945	01/03/14 03:54
Bromodichloromethane	< .001	mg/l			WG699945	01/03/14 03:54
Bromoform	< .001	mg/l			WG699945	01/03/14 03:54
Bromomethane	< .005	mg/l			WG699945	01/03/14 03:54
Carbon disulfide	< .001	mg/l			WG699945	01/03/14 03:54

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Quality Assurance Report
Level II

L675607

January 07, 2014

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Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Carbon tetrachloride	< .001	mg/l			WG699945	01/03/14 03:54
Chlorobenzene	< .001	mg/l			WG699945	01/03/14 03:54
Chlorodibromomethane	< .001	mg/l			WG699945	01/03/14 03:54
Chloroethane	< .005	mg/l			WG699945	01/03/14 03:54
Chloroform	< .005	mg/l			WG699945	01/03/14 03:54
Chloromethane	< .0025	mg/l			WG699945	01/03/14 03:54
cis-1,2-Dichloroethene	< .001	mg/l			WG699945	01/03/14 03:54
cis-1,3-Dichloropropene	< .001	mg/l			WG699945	01/03/14 03:54
Dibromomethane	< .001	mg/l			WG699945	01/03/14 03:54
Ethylbenzene	< .001	mg/l			WG699945	01/03/14 03:54
Iodomethane	< .01	mg/l			WG699945	01/03/14 03:54
Methylene Chloride	< .005	mg/l			WG699945	01/03/14 03:54
Styrene	< .001	mg/l			WG699945	01/03/14 03:54
Tetrachloroethene	< .001	mg/l			WG699945	01/03/14 03:54
Toluene	< .005	mg/l			WG699945	01/03/14 03:54
trans-1,2-Dichloroethene	< .001	mg/l			WG699945	01/03/14 03:54
trans-1,3-Dichloropropene	< .001	mg/l			WG699945	01/03/14 03:54
trans-1,4-Dichloro-2-butene	< .0025	mg/l			WG699945	01/03/14 03:54
Trichloroethene	< .001	mg/l			WG699945	01/03/14 03:54
Trichlorofluoromethane	< .005	mg/l			WG699945	01/03/14 03:54
Vinyl acetate	< .01	mg/l			WG699945	01/03/14 03:54
Vinyl chloride	< .001	mg/l			WG699945	01/03/14 03:54
Xylenes, Total	< .003	mg/l			WG699945	01/03/14 03:54
4-Bromofluorobenzene		% Rec.	89.30	71-126	WG699945	01/03/14 03:54
Dibromofluoromethane		% Rec.	94.70	78.3-121	WG699945	01/03/14 03:54
Toluene-d8		% Rec.	99.10	88.5-111	WG699945	01/03/14 03:54
a,a,a-Trifluorotoluene		% Rec.	97.20	85-114	WG699945	01/03/14 03:54
1,1,1,2-Tetrachloroethane	< .001	mg/l			WG700087	01/04/14 12:22
1,1,1-Trichloroethane	< .001	mg/l			WG700087	01/04/14 12:22
1,1,2,2-Tetrachloroethane	< .001	mg/l			WG700087	01/04/14 12:22
1,1,2-Trichloroethane	< .001	mg/l			WG700087	01/04/14 12:22
1,1-Dichloroethane	< .001	mg/l			WG700087	01/04/14 12:22
1,1-Dichloroethene	< .001	mg/l			WG700087	01/04/14 12:22
1,2,3-Trichloropropane	< .001	mg/l			WG700087	01/04/14 12:22
1,2-Dichlorobenzene	< .001	mg/l			WG700087	01/04/14 12:22
1,2-Dichloroethane	< .001	mg/l			WG700087	01/04/14 12:22
1,2-Dichloropropane	< .001	mg/l			WG700087	01/04/14 12:22
1,4-Dichlorobenzene	< .001	mg/l			WG700087	01/04/14 12:22
2-Butanone (MEK)	< .01	mg/l			WG700087	01/04/14 12:22
2-Hexanone	< .01	mg/l			WG700087	01/04/14 12:22
4-Methyl-2-pentanone (MIBK)	< .01	mg/l			WG700087	01/04/14 12:22
Acetone	< .05	mg/l			WG700087	01/04/14 12:22
Acrylonitrile	< .01	mg/l			WG700087	01/04/14 12:22
Benzene	< .001	mg/l			WG700087	01/04/14 12:22
Bromochloromethane	< .001	mg/l			WG700087	01/04/14 12:22
Bromodichloromethane	< .001	mg/l			WG700087	01/04/14 12:22
Bromoform	< .001	mg/l			WG700087	01/04/14 12:22
Bromomethane	< .005	mg/l			WG700087	01/04/14 12:22
Carbon disulfide	< .001	mg/l			WG700087	01/04/14 12:22
Carbon tetrachloride	< .001	mg/l			WG700087	01/04/14 12:22
Chlorobenzene	< .001	mg/l			WG700087	01/04/14 12:22
Chlorodibromomethane	< .001	mg/l			WG700087	01/04/14 12:22
Chloroethane	< .005	mg/l			WG700087	01/04/14 12:22
Chloroform	< .005	mg/l			WG700087	01/04/14 12:22
Chloromethane	< .0025	mg/l			WG700087	01/04/14 12:22
cis-1,2-Dichloroethene	< .001	mg/l			WG700087	01/04/14 12:22
cis-1,3-Dichloropropene	< .001	mg/l			WG700087	01/04/14 12:22

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Quality Assurance Report
Level II

L675607

January 07, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Dibromomethane	< .001	mg/l			WG700087	01/04/14 12:22
Ethylbenzene	< .001	mg/l			WG700087	01/04/14 12:22
Iodomethane	< .01	mg/l			WG700087	01/04/14 12:22
Methylene Chloride	< .005	mg/l			WG700087	01/04/14 12:22
Styrene	< .001	mg/l			WG700087	01/04/14 12:22
Tetrachloroethene	< .001	mg/l			WG700087	01/04/14 12:22
Toluene	< .005	mg/l			WG700087	01/04/14 12:22
trans-1,2-Dichloroethene	< .001	mg/l			WG700087	01/04/14 12:22
trans-1,3-Dichloropropene	< .001	mg/l			WG700087	01/04/14 12:22
trans-1,4-Dichloro-2-butene	< .0025	mg/l			WG700087	01/04/14 12:22
Trichloroethene	< .001	mg/l			WG700087	01/04/14 12:22
Trichlorofluoromethane	< .005	mg/l			WG700087	01/04/14 12:22
Vinyl acetate	< .01	mg/l			WG700087	01/04/14 12:22
Vinyl chloride	< .001	mg/l			WG700087	01/04/14 12:22
Xylenes, Total	< .003	mg/l			WG700087	01/04/14 12:22
4-Bromofluorobenzene		% Rec.	102.0	71-126	WG700087	01/04/14 12:22
Dibromofluoromethane		% Rec.	101.0	78.3-121	WG700087	01/04/14 12:22
Toluene-d8		% Rec.	101.0	88.5-111	WG700087	01/04/14 12:22
a,a,a-Trifluorotoluene		% Rec.	106.0	85-114	WG700087	01/04/14 12:22
Sulfate	< 5	mg/l			WG700401	01/06/14 12:56

Duplicate

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
Chloride	mg/l	20.0	19.3	3.56	20	L675576-02	WG697964
Nitrate	mg/l	3.30	3.30	0.0	20	L675576-02	WG697964
Sulfate	mg/l	19.0	19.0	0.0	20	L675576-02	WG697964
Chloride	mg/l	0.0	0.0	0.0	20	L675607-05	WG697964
Nitrate	mg/l	0.0	0.0	0.0	20	L675607-05	WG697964
Sulfate	mg/l	0.0	0.0	0.0	20	L675607-05	WG697964
Mercury	mg/l	0.00110	0.000757	34.0*	20	L675542-03	WG699123
Aluminum	mg/l	0.0	0.0228	40.0*	20	L675546-07	WG699290
Barium	mg/l	0.0	0.00485	0.0	20	L675546-07	WG699290
Boron	mg/l	0.0	0.0366	4.00	20	L675546-07	WG699290
Calcium	mg/l	0.0	0.345	1.00	20	L675546-07	WG699290
Chromium	mg/l	0.0	0.000710	50.0*	20	L675546-07	WG699290
Cobalt	mg/l	0.0	0.00157	24.0*	20	L675546-07	WG699290
Iron	mg/l	0.0	0.0317	9.00	20	L675546-07	WG699290
Magnesium	mg/l	0.540	0.525	4.00	20	L675546-07	WG699290
Manganese	mg/l	0.0	0.00283	4.00	20	L675546-07	WG699290
Nickel	mg/l	0.0	0.00355	43.0*	20	L675546-07	WG699290
Potassium	mg/l	0.0	0.0545	77.0*	20	L675546-07	WG699290
Silver	mg/l	0.0	0.000730	147.*	20	L675546-07	WG699290
Sodium	mg/l	1.60	1.61	2.00	20	L675546-07	WG699290
Vanadium	mg/l	0.0	0.000611	48.0*	20	L675546-07	WG699290
Antimony	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283
Arsenic	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283
Beryllium	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283
Cadmium	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283
Lead	mg/l	0.0	0.000850	NA	20	L675152-03	WG699283
Selenium	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283

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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Result	Duplicate	RPD	Limit	Ref Samp	Batch
			Duplicate				
Thallium	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283
Zinc	mg/l	0.0	0.0	0.0	20	L675152-03	WG699283
1,2-Dibromo-3-Chloropropane	mg/l	0.0	0.0	0.0	20		WG699589
Ethylene Dibromide	mg/l	0.0	0.0	0.0	20		WG699589
Copper	mg/l	0.0	0.0	0.0	20	L675164-02	WG699576
Ammonia Nitrogen	mg/l	0.600	0.640	6.45	20	L674718-01	WG699916
Ammonia Nitrogen	mg/l	1.80	1.80	0.0	20	L675560-01	WG699916
Sulfate	mg/l	11.0	11.0	0.0	20	L676644-08	WG700401
Sulfate	mg/l	12.0	12.0	0.0	20	L675607-02	WG700401

Analyte	Units	Known Val	Laboratory Control Sample Result	% Rec	Limit	Batch
Chloride	mg/l	40	40.0	100.	90-110	WG697964
Nitrate	mg/l	8	8.18	102.	90-110	WG697964
Sulfate	mg/l	40	41.2	103.	90-110	WG697964
Mercury	mg/l	.003	0.00274	91.0	85-115	WG699123
Aluminum	mg/l	1	1.01	101.	85-115	WG699290
Barium	mg/l	1	1.05	105.	85-115	WG699290
Boron	mg/l	1	0.953	95.0	85-115	WG699290
Calcium	mg/l	10	10.5	105.	85-115	WG699290
Chromium	mg/l	1	1.05	105.	85-115	WG699290
Cobalt	mg/l	1	1.05	105.	85-115	WG699290
Iron	mg/l	1	1.03	103.	85-115	WG699290
Magnesium	mg/l	10	10.7	107.	85-115	WG699290
Manganese	mg/l	1	1.06	106.	85-115	WG699290
Nickel	mg/l	1	0.942	94.0	85-115	WG699290
Potassium	mg/l	10	10.5	105.	85-115	WG699290
Silver	mg/l	1	0.997	100.	85-115	WG699290
Sodium	mg/l	10	10.2	102.	85-115	WG699290
Vanadium	mg/l	1	1.05	105.	85-115	WG699290
Antimony	mg/l	.05	0.0504	101.	85-115	WG699283
Arsenic	mg/l	.05	0.0485	97.0	85-115	WG699283
Beryllium	mg/l	.05	0.0498	99.6	85-115	WG699283
Cadmium	mg/l	.05	0.0494	98.8	85-115	WG699283
Lead	mg/l	.05	0.0500	100.	85-115	WG699283
Selenium	mg/l	.05	0.0508	102.	85-115	WG699283
Thallium	mg/l	.05	0.0489	97.8	85-115	WG699283
Zinc	mg/l	.05	0.0497	99.4	85-115	WG699283
1,2-Dibromo-3-Chloropropane	mg/l	.00025	0.000215	86.1	60-140	WG699589
Ethylene Dibromide	mg/l	.00025	0.000226	90.5	60-140	WG699589
1,1,1,2-Tetrachloroethane				84.30	60-140	WG699589

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Analyte	Units	Laboratory Control Sample Known Val	Result	% Rec	Limit	Batch
Copper	mg/l	.05	0.0568	114.	85-115	WG699576
1,1,1,2-Tetrachloroethane	mg/l	.025	0.0238	95.1	74.2-124	WG699441
1,1,1-Trichloroethane	mg/l	.025	0.0218	87.2	73.2-123	WG699441
1,1,2,2-Tetrachloroethane	mg/l	.025	0.0249	99.7	70.7-122	WG699441
1,1,2-Trichloroethane	mg/l	.025	0.0248	99.1	77.7-118	WG699441
1,1-Dichloroethane	mg/l	.025	0.0234	93.7	70.7-126	WG699441
1,1-Dichloroethene	mg/l	.025	0.0241	96.4	67.8-129	WG699441
1,2,3-Trichloropropane	mg/l	.025	0.0272	109.	71.8-121	WG699441
1,2-Dichlorobenzene	mg/l	.025	0.0248	99.2	78.4-117	WG699441
1,2-Dichloroethane	mg/l	.025	0.0215	85.8	68.8-124	WG699441
1,2-Dichloropropane	mg/l	.025	0.0243	97.1	76.5-119	WG699441
1,4-Dichlorobenzene	mg/l	.025	0.0238	95.3	78.8-115	WG699441
2-Butanone (MEK)	mg/l	.125	0.149	119.	55-149	WG699441
2-Hexanone	mg/l	.125	0.160	128.	65.6-144	WG699441
4-Methyl-2-pentanone (MIBK)	mg/l	.125	0.147	118.	70.5-133	WG699441
Acetone	mg/l	.125	0.142	113.	35.6-163	WG699441
Acrylonitrile	mg/l	.125	0.149	119.	55.2-130	WG699441
Benzene	mg/l	.025	0.0219	87.8	74.8-121	WG699441
Bromochloromethane	mg/l	.025	0.0250	99.9	77.6-119	WG699441
Bromodichloromethane	mg/l	.025	0.0206	82.5	75.1-116	WG699441
Bromoform	mg/l	.025	0.0259	104.	67.5-130	WG699441
Bromomethane	mg/l	.025	0.0176	70.5	49.9-162	WG699441
Carbon disulfide	mg/l	.025	0.0244	97.8	64.6-140	WG699441
Carbon tetrachloride	mg/l	.025	0.0229	91.4	70.2-123	WG699441
Chlorobenzene	mg/l	.025	0.0239	95.7	78.1-119	WG699441
Chlorodibromomethane	mg/l	.025	0.0238	95.2	74-121	WG699441
Chloroethane	mg/l	.025	0.0241	96.3	61.7-135	WG699441
Chloroform	mg/l	.025	0.0221	88.3	76-121	WG699441
Chloromethane	mg/l	.025	0.0255	102.	61.5-129	WG699441
cis-1,2-Dichloroethene	mg/l	.025	0.0238	95.3	76-119	WG699441
cis-1,3-Dichloropropene	mg/l	.025	0.0238	95.0	78.2-120	WG699441
Dibromomethane	mg/l	.025	0.0244	97.6	79.5-118	WG699441
Ethylbenzene	mg/l	.025	0.0238	95.1	78.8-122	WG699441
Iodomethane	mg/l	.125	0.109	87.4	61-130	WG699441
Methylene Chloride	mg/l	.025	0.0229	91.8	70.3-120	WG699441
Styrene	mg/l	.025	0.0249	99.6	80.4-126	WG699441
Tetrachloroethene	mg/l	.025	0.0243	97.2	72.6-126	WG699441
Toluene	mg/l	.025	0.0225	89.9	79.7-116	WG699441
trans-1,2-Dichloroethene	mg/l	.025	0.0229	91.5	72.6-121	WG699441
trans-1,3-Dichloropropene	mg/l	.025	0.0245	98.2	74.3-123	WG699441
trans-1,4-Dichloro-2-butene	mg/l	.025	0.0218	87.0	65.1-123	WG699441
Trichloroethene	mg/l	.025	0.0239	95.8	77.7-118	WG699441
Trichlorofluoromethane	mg/l	.025	0.0224	89.5	63.5-135	WG699441
Vinyl acetate	mg/l	.125	0.115	92.3	65-138	WG699441
Vinyl chloride	mg/l	.025	0.0264	106.	65.9-128	WG699441
Xylenes, Total	mg/l	.075	0.0666	88.8	78.7-121	WG699441
4-Bromofluorobenzene				97.60	71-126	WG699441
Dibromofluoromethane				98.60	78.3-121	WG699441
Toluene-d8				102.0	88.5-111	WG699441
a,a,a-Trifluorotoluene				105.0	85-114	WG699441
Ammonia Nitrogen	mg/l	7.5	7.62	102.	90-110	WG699916
1,1,1,2-Tetrachloroethane	mg/l	.025	0.0235	94.2	74.2-124	WG699945
1,1,1-Trichloroethane	mg/l	.025	0.0248	99.1	73.2-123	WG699945

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Quality Assurance Report
Level II

L675607

January 07, 2014

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
1,1,2,2-Tetrachloroethane	mg/l	.025	0.0241	96.5	70.7-122	WG699945
1,1,2-Trichloroethane	mg/l	.025	0.0252	101.	77.7-118	WG699945
1,1-Dichloroethane	mg/l	.025	0.0261	104.	70.7-126	WG699945
1,1-Dichloroethene	mg/l	.025	0.0242	96.8	67.8-129	WG699945
1,2,3-Trichloropropane	mg/l	.025	0.0234	93.4	71.8-121	WG699945
1,2-Dichlorobenzene	mg/l	.025	0.0253	101.	78.4-117	WG699945
1,2-Dichloroethane	mg/l	.025	0.0256	102.	68.8-124	WG699945
1,2-Dichloropropane	mg/l	.025	0.0276	110.	76.5-119	WG699945
1,4-Dichlorobenzene	mg/l	.025	0.0260	104.	78.8-115	WG699945
2-Butanone (MEK)	mg/l	.125	0.172	138.	55-149	WG699945
2-Hexanone	mg/l	.125	0.161	129.	65.6-144	WG699945
4-Methyl-2-pentanone (MIBK)	mg/l	.125	0.152	121.	70.5-133	WG699945
Acetone	mg/l	.125	0.207	165.*	35.6-163	WG699945
Acrylonitrile	mg/l	.125	0.132	106.	55.2-130	WG699945
Benzene	mg/l	.025	0.0257	103.	74.8-121	WG699945
Bromochloromethane	mg/l	.025	0.0240	96.1	77.6-119	WG699945
Bromodichloromethane	mg/l	.025	0.0243	97.4	75.1-116	WG699945
Bromoform	mg/l	.025	0.0233	93.3	67.5-130	WG699945
Bromomethane	mg/l	.025	0.0350	140.	49.9-162	WG699945
Carbon disulfide	mg/l	.025	0.0259	104.	64.6-140	WG699945
Carbon tetrachloride	mg/l	.025	0.0246	98.4	70.2-123	WG699945
Chlorobenzene	mg/l	.025	0.0251	101.	78.1-119	WG699945
Chlorodibromomethane	mg/l	.025	0.0233	93.1	74-121	WG699945
Chloroethane	mg/l	.025	0.0270	108.	61.7-135	WG699945
Chloroform	mg/l	.025	0.0248	99.3	76-121	WG699945
Chloromethane	mg/l	.025	0.0255	102.	61.5-129	WG699945
cis-1,2-Dichloroethene	mg/l	.025	0.0246	98.5	76-119	WG699945
cis-1,3-Dichloropropene	mg/l	.025	0.0278	111.	78.2-120	WG699945
Dibromomethane	mg/l	.025	0.0264	106.	79.5-118	WG699945
Ethylbenzene	mg/l	.025	0.0261	105.	78.8-122	WG699945
Iodomethane	mg/l	.125	0.121	96.9	61-130	WG699945
Methylene Chloride	mg/l	.025	0.0236	94.4	70.3-120	WG699945
Styrene	mg/l	.025	0.0265	106.	80.4-126	WG699945
Tetrachloroethene	mg/l	.025	0.0243	97.2	72.6-126	WG699945
Toluene	mg/l	.025	0.0265	106.	79.7-116	WG699945
trans-1,2-Dichloroethene	mg/l	.025	0.0245	98.2	72.6-121	WG699945
trans-1,3-Dichloropropene	mg/l	.025	0.0266	107.	74.3-123	WG699945
trans-1,4-Dichloro-2-butene	mg/l	.025	0.0237	94.7	65.1-123	WG699945
Trichloroethene	mg/l	.025	0.0244	97.5	77.7-118	WG699945
Trichlorofluoromethane	mg/l	.025	0.0242	96.6	63.5-135	WG699945
Vinyl acetate	mg/l	.125	0.130	104.	65-138	WG699945
Vinyl chloride	mg/l	.025	0.0257	103.	65.9-128	WG699945
Xylenes, Total	mg/l	.075	0.0767	102.	78.7-121	WG699945
4-Bromofluorobenzene				87.10	71-126	WG699945
Dibromofluoromethane				92.20	78.3-121	WG699945
Toluene-d8				100.0	88.5-111	WG699945
a,a,a-Trifluorotoluene				97.50	85-114	WG699945
1,1,1,2-Tetrachloroethane	mg/l	.025	0.0246	98.4	74.2-124	WG700087
1,1,1-Trichloroethane	mg/l	.025	0.0248	99.3	73.2-123	WG700087
1,1,2,2-Tetrachloroethane	mg/l	.025	0.0223	89.3	70.7-122	WG700087
1,1,2-Trichloroethane	mg/l	.025	0.0232	92.8	77.7-118	WG700087
1,1-Dichloroethane	mg/l	.025	0.0248	99.3	70.7-126	WG700087
1,1-Dichloroethene	mg/l	.025	0.0244	97.7	67.8-129	WG700087
1,2,3-Trichloropropane	mg/l	.025	0.0238	95.2	71.8-121	WG700087
1,2-Dichlorobenzene	mg/l	.025	0.0242	96.8	78.4-117	WG700087
1,2-Dichloroethane	mg/l	.025	0.0249	99.5	68.8-124	WG700087
1,2-Dichloropropane	mg/l	.025	0.0253	101.	76.5-119	WG700087

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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Laboratory Control Sample Known Val	Result	% Rec	Limit	Batch
1,4-Dichlorobenzene	mg/l	.025	0.0227	90.8	78.8-115	WG700087
2-Butanone (MEK)	mg/l	.125	0.124	98.9	55-149	WG700087
2-Hexanone	mg/l	.125	0.123	98.0	65.6-144	WG700087
4-Methyl-2-pentanone (MIBK)	mg/l	.125	0.130	104.	70.5-133	WG700087
Acetone	mg/l	.125	0.122	97.2	35.6-163	WG700087
Acrylonitrile	mg/l	.125	0.124	99.4	55.2-130	WG700087
Benzene	mg/l	.025	0.0234	93.6	74.8-121	WG700087
Bromochloromethane	mg/l	.025	0.0240	95.8	77.6-119	WG700087
Bromodichloromethane	mg/l	.025	0.0239	95.5	75.1-116	WG700087
Bromoform	mg/l	.025	0.0240	96.0	67.5-130	WG700087
Bromomethane	mg/l	.025	0.0234	93.6	49.9-162	WG700087
Carbon disulfide	mg/l	.025	0.0223	89.2	64.6-140	WG700087
Carbon tetrachloride	mg/l	.025	0.0244	97.7	70.2-123	WG700087
Chlorobenzene	mg/l	.025	0.0233	93.3	78.1-119	WG700087
Chlorodibromomethane	mg/l	.025	0.0241	96.5	74-121	WG700087
Chloroethane	mg/l	.025	0.0233	93.1	61.7-135	WG700087
Chloroform	mg/l	.025	0.0247	98.7	76-121	WG700087
Chloromethane	mg/l	.025	0.0228	91.3	61.5-129	WG700087
cis-1,2-Dichloroethene	mg/l	.025	0.0241	96.4	76-119	WG700087
cis-1,3-Dichloropropene	mg/l	.025	0.0254	102.	78.2-120	WG700087
Dibromomethane	mg/l	.025	0.0241	96.3	79.5-118	WG700087
Ethylbenzene	mg/l	.025	0.0240	96.2	78.8-122	WG700087
Iodomethane	mg/l	.125	0.116	93.0	61-130	WG700087
Methylene Chloride	mg/l	.025	0.0229	91.5	70.3-120	WG700087
Styrene	mg/l	.025	0.0252	101.	80.4-126	WG700087
Tetrachloroethene	mg/l	.025	0.0226	90.2	72.6-126	WG700087
Toluene	mg/l	.025	0.0241	96.4	79.7-116	WG700087
trans-1,2-Dichloroethene	mg/l	.025	0.0228	91.1	72.6-121	WG700087
trans-1,3-Dichloropropene	mg/l	.025	0.0241	96.2	74.3-123	WG700087
trans-1,4-Dichloro-2-butene	mg/l	.025	0.0217	86.7	65.1-123	WG700087
Trichloroethene	mg/l	.025	0.0240	95.8	77.7-118	WG700087
Trichlorofluoromethane	mg/l	.025	0.0239	95.7	63.5-135	WG700087
Vinyl acetate	mg/l	.125	0.112	90.0	65-138	WG700087
Vinyl chloride	mg/l	.025	0.0230	92.0	65.9-128	WG700087
Xylenes, Total	mg/l	.075	0.0722	96.3	78.7-121	WG700087
4-Bromofluorobenzene				102.0	71-126	WG700087
Dibromofluoromethane				98.00	78.3-121	WG700087
Toluene-d8				100.0	88.5-111	WG700087
a,a,a-Trifluorotoluene				105.0	85-114	WG700087
Sulfate	mg/l	40	40.2	101.	90-110	WG700401

Analyte	Units	Laboratory Control Sample Duplicate Result	Ref	%Rec	Limit	RPD	Limit	Batch
Chloride	mg/l	40.0	40.0	100.	90-110	0.0	20	WG697964
Nitrate	mg/l	8.19	8.18	102.	90-110	0.122	20	WG697964
Sulfate	mg/l	41.7	41.2	104.	90-110	1.21	20	WG697964
1,2-Dibromo-3-Chloropropane	mg/l	0.000213	0.000215	85.0	60-140	0.970	20	WG699589
Ethylene Dibromide	mg/l	0.000225	0.000226	90.0	60-140	0.520	20	WG699589
1,1,1,2-Tetrachloroethane				83.70	60-140			WG699589
1,1,1,2-Tetrachloroethane	mg/l	0.0224	0.0238	90.0	74.2-124	5.74	20	WG699441
1,1,1-Trichloroethane	mg/l	0.0210	0.0218	84.0	73.2-123	3.81	20	WG699441
1,1,2,2-Tetrachloroethane	mg/l	0.0235	0.0249	94.0	70.7-122	5.69	20	WG699441

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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Laboratory Control Sample Result	Ref	%Rec	Limit	Duplicate RPD	Limit	Batch
1,1,2-Trichloroethane	mg/l	0.0228	0.0248	91.0	77.7-118	8.30	20	WG699441
1,1-Dichloroethane	mg/l	0.0224	0.0234	90.0	70.7-126	4.50	20	WG699441
1,1-Dichloroethene	mg/l	0.0229	0.0241	92.0	67.8-129	4.95	20	WG699441
1,2,3-Trichloropropane	mg/l	0.0249	0.0272	99.0	71.8-121	9.03	20	WG699441
1,2-Dichlorobenzene	mg/l	0.0230	0.0248	92.0	78.4-117	7.64	20	WG699441
1,2-Dichloroethane	mg/l	0.0206	0.0215	82.0	68.8-124	3.91	20	WG699441
1,2-Dichloropropane	mg/l	0.0240	0.0243	96.0	76.5-119	1.14	20	WG699441
1,4-Dichlorobenzene	mg/l	0.0221	0.0238	88.0	78.8-115	7.29	20	WG699441
2-Butanone (MEK)	mg/l	0.137	0.149	110.	55-149	8.11	20	WG699441
2-Hexanone	mg/l	0.143	0.160	115.	65.6-144	11.3	20	WG699441
4-Methyl-2-pentanone (MIBK)	mg/l	0.137	0.147	110.	70.5-133	7.11	20	WG699441
Acetone	mg/l	0.130	0.142	104.	35.6-163	8.68	23.9	WG699441
Acrylonitrile	mg/l	0.142	0.149	114.	55.2-130	4.26	20	WG699441
Benzene	mg/l	0.0212	0.0219	85.0	74.8-121	3.34	20	WG699441
Bromochloromethane	mg/l	0.0232	0.0250	93.0	77.6-119	7.46	20	WG699441
Bromodichloromethane	mg/l	0.0196	0.0206	78.0	75.1-116	5.04	20	WG699441
Bromoform	mg/l	0.0239	0.0259	96.0	67.5-130	8.15	20	WG699441
Bromomethane	mg/l	0.0160	0.0176	64.0	49.9-162	9.52	20	WG699441
Carbon disulfide	mg/l	0.0231	0.0244	92.0	64.6-140	5.80	20	WG699441
Carbon tetrachloride	mg/l	0.0219	0.0229	88.0	70.2-123	4.20	20	WG699441
Chlorobenzene	mg/l	0.0227	0.0239	91.0	78.1-119	5.29	20	WG699441
Chlorodibromomethane	mg/l	0.0224	0.0238	90.0	74-121	6.12	20	WG699441
Chloroethane	mg/l	0.0221	0.0241	88.0	61.7-135	8.48	20	WG699441
Chloroform	mg/l	0.0215	0.0221	86.0	76-121	2.51	20	WG699441
Chloromethane	mg/l	0.0237	0.0255	95.0	61.5-129	7.62	20	WG699441
cis-1,2-Dichloroethene	mg/l	0.0227	0.0238	91.0	76-119	4.86	20	WG699441
cis-1,3-Dichloropropene	mg/l	0.0223	0.0238	89.0	78.2-120	6.32	20	WG699441
Dibromomethane	mg/l	0.0228	0.0244	91.0	79.5-118	6.61	20	WG699441
Ethylbenzene	mg/l	0.0221	0.0238	88.0	78.8-122	7.12	20	WG699441
Iodomethane	mg/l	0.104	0.109	83.0	61-130	4.97	20	WG699441
Methylene Chloride	mg/l	0.0220	0.0229	88.0	70.3-120	4.04	20	WG699441
Styrene	mg/l	0.0237	0.0249	95.0	80.4-126	5.10	20	WG699441
Tetrachloroethene	mg/l	0.0235	0.0243	94.0	72.6-126	3.49	20	WG699441
Toluene	mg/l	0.0216	0.0225	86.0	79.7-116	3.94	20	WG699441
trans-1,2-Dichloroethene	mg/l	0.0223	0.0229	89.0	72.6-121	2.51	20	WG699441
trans-1,3-Dichloropropene	mg/l	0.0233	0.0245	93.0	74.3-123	5.35	20	WG699441
trans-1,4-Dichloro-2-butene	mg/l	0.0209	0.0218	83.0	65.1-123	4.23	20	WG699441
Trichloroethene	mg/l	0.0226	0.0239	90.0	77.7-118	5.93	20	WG699441
Trichlorofluoromethane	mg/l	0.0216	0.0224	86.0	63.5-135	3.38	20	WG699441
Vinyl acetate	mg/l	0.111	0.115	89.0	65-138	3.83	20	WG699441
Vinyl chloride	mg/l	0.0249	0.0264	100.	65.9-128	5.90	20	WG699441
Xylenes, Total	mg/l	0.0643	0.0666	86.0	78.7-121	3.58	20	WG699441
4-Bromofluorobenzene				97.90	71-126			WG699441
Dibromofluoromethane				98.80	78.3-121			WG699441
Toluene-d8				102.0	88.5-111			WG699441
a,a,a-Trifluorotoluene				105.0	85-114			WG699441
Ammonia Nitrogen	mg/l	7.83	7.62	104.	90-110	2.72	20	WG699916
1,1,1,2-Tetrachloroethane	mg/l	0.0254	0.0235	102.	74.2-124	7.73	20	WG699945
1,1,1-Trichloroethane	mg/l	0.0268	0.0248	107.	73.2-123	7.70	20	WG699945
1,1,2,2-Tetrachloroethane	mg/l	0.0245	0.0241	98.0	70.7-122	1.40	20	WG699945
1,1,2-Trichloroethane	mg/l	0.0262	0.0252	105.	77.7-118	3.73	20	WG699945
1,1-Dichloroethane	mg/l	0.0282	0.0261	113.	70.7-126	7.72	20	WG699945
1,1-Dichloroethene	mg/l	0.0255	0.0242	102.	67.8-129	5.40	20	WG699945
1,2,3-Trichloropropane	mg/l	0.0244	0.0234	98.0	71.8-121	4.42	20	WG699945
1,2-Dichlorobenzene	mg/l	0.0258	0.0253	103.	78.4-117	2.05	20	WG699945

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Analyte	Units	Laboratory Control Sample Result	Ref	%Rec	Limit	Duplicate RPD	Limit	Batch
1,2-Dichloroethane	mg/l	0.0267	0.0256	107.	68.8-124	4.17	20	WG699945
1,2-Dichloropropane	mg/l	0.0288	0.0276	115.	76.5-119	4.36	20	WG699945
1,4-Dichlorobenzene	mg/l	0.0262	0.0260	105.	78.8-115	0.720	20	WG699945
2-Butanone (MEK)	mg/l	0.176	0.172	140.	55-149	2.21	20	WG699945
2-Hexanone	mg/l	0.162	0.161	129.	65.6-144	0.490	20	WG699945
4-Methyl-2-pentanone (MIBK)	mg/l	0.161	0.152	129.	70.5-133	6.10	20	WG699945
Acetone	mg/l	0.214	0.207	171*	35.6-163	3.45	23.9	WG699945
Acrylonitrile	mg/l	0.139	0.132	111.	55.2-130	5.24	20	WG699945
Benzene	mg/l	0.0272	0.0257	109.	74.8-121	5.72	20	WG699945
Bromochloromethane	mg/l	0.0259	0.0240	104.	77.6-119	7.63	20	WG699945
Bromodichloromethane	mg/l	0.0253	0.0243	101.	75.1-116	4.03	20	WG699945
Bromoform	mg/l	0.0248	0.0233	99.0	67.5-130	6.19	20	WG699945
Bromomethane	mg/l	0.0389	0.0350	156.	49.9-162	10.6	20	WG699945
Carbon disulfide	mg/l	0.0280	0.0259	112.	64.6-140	7.72	20	WG699945
Carbon tetrachloride	mg/l	0.0261	0.0246	104.	70.2-123	5.74	20	WG699945
Chlorobenzene	mg/l	0.0261	0.0251	104.	78.1-119	3.63	20	WG699945
Chlorodibromomethane	mg/l	0.0248	0.0233	99.0	74-121	6.23	20	WG699945
Chloroethane	mg/l	0.0290	0.0270	116.	61.7-135	6.96	20	WG699945
Chloroform	mg/l	0.0270	0.0248	108.	76-121	8.52	20	WG699945
Chloromethane	mg/l	0.0279	0.0255	112.	61.5-129	8.98	20	WG699945
cis-1,2-Dichloroethene	mg/l	0.0264	0.0246	106.	76-119	6.99	20	WG699945
cis-1,3-Dichloropropene	mg/l	0.0284	0.0278	114.	78.2-120	2.22	20	WG699945
Dibromomethane	mg/l	0.0274	0.0264	110.	79.5-118	3.74	20	WG699945
Ethylbenzene	mg/l	0.0272	0.0261	109.	78.8-122	3.99	20	WG699945
Iodomethane	mg/l	0.131	0.121	105.	61-130	8.08	20	WG699945
Methylene Chloride	mg/l	0.0252	0.0236	101.	70.3-120	6.68	20	WG699945
Styrene	mg/l	0.0282	0.0265	113.	80.4-126	5.98	20	WG699945
Tetrachloroethene	mg/l	0.0238	0.0243	95.0	72.6-126	2.05	20	WG699945
Toluene	mg/l	0.0274	0.0265	110.	79.7-116	3.66	20	WG699945
trans-1,2-Dichloroethene	mg/l	0.0266	0.0245	106.	72.6-121	8.23	20	WG699945
trans-1,3-Dichloropropene	mg/l	0.0254	0.0266	102.	74.3-123	4.62	20	WG699945
trans-1,4-Dichloro-2-butene	mg/l	0.0241	0.0237	96.0	65.1-123	1.63	20	WG699945
Trichloroethene	mg/l	0.0255	0.0244	102.	77.7-118	4.40	20	WG699945
Trichlorofluoromethane	mg/l	0.0257	0.0242	103.	63.5-135	6.29	20	WG699945
Vinyl acetate	mg/l	0.134	0.130	107.	65-138	3.35	20	WG699945
Vinyl chloride	mg/l	0.0279	0.0257	112.	65.9-128	8.18	20	WG699945
Xylenes, Total	mg/l	0.0796	0.0767	106.	78.7-121	3.81	20	WG699945
4-Bromofluorobenzene				90.50	71-126			WG699945
Dibromofluoromethane				92.50	78.3-121			WG699945
Toluene-d8				98.60	88.5-111			WG699945
a,a,a-Trifluorotoluene				96.00	85-114			WG699945
1,1,1,2-Tetrachloroethane	mg/l	0.0243	0.0246	97.0	74.2-124	1.09	20	WG700087
1,1,1-Trichloroethane	mg/l	0.0240	0.0248	96.0	73.2-123	3.32	20	WG700087
1,1,2,2-Tetrachloroethane	mg/l	0.0222	0.0223	89.0	70.7-122	0.480	20	WG700087
1,1,2-Trichloroethane	mg/l	0.0229	0.0232	91.0	77.7-118	1.48	20	WG700087
1,1-Dichloroethane	mg/l	0.0240	0.0248	96.0	70.7-126	3.55	20	WG700087
1,1-Dichloroethene	mg/l	0.0234	0.0244	94.0	67.8-129	4.31	20	WG700087
1,2,3-Trichloropropane	mg/l	0.0228	0.0238	91.0	71.8-121	4.50	20	WG700087
1,2-Dichlorobenzene	mg/l	0.0234	0.0242	94.0	78.4-117	3.48	20	WG700087
1,2-Dichloroethane	mg/l	0.0245	0.0249	98.0	68.8-124	1.29	20	WG700087
1,2-Dichloropropane	mg/l	0.0246	0.0253	98.0	76.5-119	3.04	20	WG700087
1,4-Dichlorobenzene	mg/l	0.0224	0.0227	90.0	78.8-115	1.14	20	WG700087
2-Butanone (MEK)	mg/l	0.118	0.124	94.0	55-149	4.96	20	WG700087
2-Hexanone	mg/l	0.118	0.123	94.0	65.6-144	3.73	20	WG700087
4-Methyl-2-pentanone (MIBK)	mg/l	0.123	0.130	98.0	70.5-133	5.55	20	WG700087
Acetone	mg/l	0.116	0.122	92.0	35.6-163	4.89	23.9	WG700087
Acrylonitrile	mg/l	0.119	0.124	96.0	55.2-130	3.91	20	WG700087

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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Laboratory Control Sample Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0229	0.0234	91.0	74.8-121	2.35	20	WG700087
Bromochloromethane	mg/l	0.0227	0.0240	91.0	77.6-119	5.47	20	WG700087
Bromodichloromethane	mg/l	0.0236	0.0239	94.0	75.1-116	0.960	20	WG700087
Bromoform	mg/l	0.0238	0.0240	95.0	67.5-130	0.740	20	WG700087
Bromomethane	mg/l	0.0227	0.0234	91.0	49.9-162	2.85	20	WG700087
Carbon disulfide	mg/l	0.0219	0.0223	87.0	64.6-140	1.92	20	WG700087
Carbon tetrachloride	mg/l	0.0238	0.0244	95.0	70.2-123	2.54	20	WG700087
Chlorobenzene	mg/l	0.0233	0.0233	93.0	78.1-119	0.0100	20	WG700087
Chlorodibromomethane	mg/l	0.0235	0.0241	94.0	74-121	2.51	20	WG700087
Chloroethane	mg/l	0.0215	0.0233	86.0	61.7-135	7.77	20	WG700087
Chloroform	mg/l	0.0235	0.0247	94.0	76-121	4.91	20	WG700087
Chloromethane	mg/l	0.0221	0.0228	88.0	61.5-129	3.23	20	WG700087
cis-1,2-Dichloroethene	mg/l	0.0234	0.0241	94.0	76-119	2.88	20	WG700087
cis-1,3-Dichloropropene	mg/l	0.0249	0.0254	100.	78.2-120	1.85	20	WG700087
Dibromomethane	mg/l	0.0241	0.0241	96.0	79.5-118	0.230	20	WG700087
Ethylbenzene	mg/l	0.0234	0.0240	94.0	78.8-122	2.81	20	WG700087
Iodomethane	mg/l	0.112	0.116	90.0	61-130	3.78	20	WG700087
Methylene Chloride	mg/l	0.0222	0.0229	89.0	70.3-120	3.03	20	WG700087
Styrene	mg/l	0.0245	0.0252	98.0	80.4-126	2.60	20	WG700087
Tetrachloroethene	mg/l	0.0225	0.0226	90.0	72.6-126	0.290	20	WG700087
Toluene	mg/l	0.0231	0.0241	92.0	79.7-116	4.41	20	WG700087
trans-1,2-Dichloroethene	mg/l	0.0221	0.0228	88.0	72.6-121	2.99	20	WG700087
trans-1,3-Dichloropropene	mg/l	0.0241	0.0241	96.0	74.3-123	0.120	20	WG700087
trans-1,4-Dichloro-2-butene	mg/l	0.0211	0.0217	84.0	65.1-123	2.52	20	WG700087
Trichloroethene	mg/l	0.0232	0.0240	93.0	77.7-118	3.07	20	WG700087
Trichlorofluoromethane	mg/l	0.0228	0.0239	91.0	63.5-135	5.02	20	WG700087
Vinyl acetate	mg/l	0.110	0.112	88.0	65-138	1.97	20	WG700087
Vinyl chloride	mg/l	0.0224	0.0230	90.0	65.9-128	2.56	20	WG700087
Xylenes, Total	mg/l	0.0711	0.0722	95.0	78.7-121	1.56	20	WG700087
4-Bromofluorobenzene				103.0	71-126			WG700087
Dibromofluoromethane				101.0	78.3-121			WG700087
Toluene-d8				101.0	88.5-111			WG700087
a,a,a-Trifluorotoluene				105.0	85-114			WG700087
Sulfate	mg/l	40.4	40.2	101.	90-110	0.496	20	WG700401

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Chloride	mg/l	274.	35.0	50	96.0	80-120	L675607-02	WG697964
Nitrate	mg/l	36.4	12.0	5	98.0	80-120	L675607-02	WG697964
Mercury	mg/l	0.00432	0.000757	.003	120.	80-120	L675542-03	WG699123
Aluminum	mg/l	1.05	0.0228	1	100.	75-125	L675546-07	WG699290
Barium	mg/l	1.06	0.00485	1	100.	75-125	L675546-07	WG699290
Boron	mg/l	0.988	0.0366	1	95.0	75-125	L675546-07	WG699290
Calcium	mg/l	10.9	0.345	10	100.	75-125	L675546-07	WG699290
Chromium	mg/l	1.06	0.000710	1	110.	75-125	L675546-07	WG699290
Cobalt	mg/l	1.07	0.00157	1	110.	75-125	L675546-07	WG699290
Iron	mg/l	1.08	0.0317	1	100.	75-125	L675546-07	WG699290
Magnesium	mg/l	11.3	0.525	10	110.	75-125	L675546-07	WG699290
Manganese	mg/l	1.07	0.00283	1	110.	75-125	L675546-07	WG699290
Nickel	mg/l	0.955	0.00355	1	95.0	75-125	L675546-07	WG699290
Potassium	mg/l	10.5	0.0545	10	100.	75-125	L675546-07	WG699290
Silver	mg/l	0.878	0.000730	1	88.0	75-125	L675546-07	WG699290

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Mr. Michael Johnson
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Quality Assurance Report
Level II

January 07, 2014

L675607

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Sodium	mg/l	12.0	1.61	10	100.	75-125	L675546-07	WG699290
Vanadium	mg/l	1.05	0.000611	1	100.	75-125	L675546-07	WG699290
Antimony	mg/l	0.0500	0.0	.05	100.	75-125	L675152-03	WG699283
Arsenic	mg/l	0.0480	0.0	.05	96.0	75-125	L675152-03	WG699283
Beryllium	mg/l	0.0499	0.0	.05	100.	75-125	L675152-03	WG699283
Cadmium	mg/l	0.0488	0.0	.05	98.0	75-125	L675152-03	WG699283
Lead	mg/l	0.0488	0.000850	.05	96.0	75-125	L675152-03	WG699283
Selenium	mg/l	0.0492	0.0	.05	98.0	75-125	L675152-03	WG699283
Thallium	mg/l	0.0476	0.0	.05	95.0	75-125	L675152-03	WG699283
Zinc	mg/l	0.0536	0.0	.05	110.	75-125	L675152-03	WG699283
Antimony	mg/l	0.0530	0.0	.05	110.	75-125	L675164-02	WG699283
Arsenic	mg/l	0.0517	0.0	.05	100.	75-125	L675164-02	WG699283
Beryllium	mg/l	0.0536	0.0	.05	110.	75-125	L675164-02	WG699283
Cadmium	mg/l	0.0524	0.0	.05	100.	75-125	L675164-02	WG699283
Selenium	mg/l	0.0506	0.0	.05	100.	75-125	L675164-02	WG699283
Thallium	mg/l	0.0514	0.0	.05	100.	75-125	L675164-02	WG699283
Zinc	mg/l	0.0704	0.0	.05	140.*	75-125	L675164-02	WG699283
1,2-Dibromo-3-Chloropropane	mg/l	0.0000761	0.0	.0001	76.0	60-140	L675542-03	WG699589
Ethylene Dibromide	mg/l	0.0000928	0.0	.0001	93.0	60-140	L675542-03	WG699589
1,1,1,2-Tetrachloroethane					80.00	60-140		WG699589
Copper	mg/l	0.0576	0.0	.05	120.	75-125	L675164-02	WG699576
1,1,1,2-Tetrachloroethane	mg/l	0.0235	0.0	.025	94.0	64-128	L675538-01	WG699441
1,1,1-Trichloroethane	mg/l	0.0218	0.0	.025	87.0	58.7-134	L675538-01	WG699441
1,1,2,2-Tetrachloroethane	mg/l	0.0251	0.0	.025	100.	56-132	L675538-01	WG699441
1,1,2-Trichloroethane	mg/l	0.0246	0.0	.025	98.0	66.3-125	L675538-01	WG699441
1,1-Dichloroethane	mg/l	0.0232	0.0	.025	93.0	58.5-132	L675538-01	WG699441
1,1-Dichloroethene	mg/l	0.0234	0.0	.025	94.0	51.1-140	L675538-01	WG699441
1,2,3-Trichloropropane	mg/l	0.0273	0.0	.025	110.	61.4-128	L675538-01	WG699441
1,2-Dichlorobenzene	mg/l	0.0247	0.0	.025	99.0	68.2-123	L675538-01	WG699441
1,2-Dichloroethane	mg/l	0.0216	0.0	.025	86.0	60-126	L675538-01	WG699441
1,2-Dichloropropane	mg/l	0.0247	0.0	.025	99.0	64.2-123	L675538-01	WG699441
1,4-Dichlorobenzene	mg/l	0.0232	0.0	.025	93.0	68.6-123	L675538-01	WG699441
2-Butanone (MEK)	mg/l	0.128	0.0	.125	100.	22.4-138	L675538-01	WG699441
2-Hexanone	mg/l	0.143	0.0	.125	110.	43.3-137	L675538-01	WG699441
4-Methyl-2-pentanone (MIBK)	mg/l	0.152	0.0	.125	120.	60.8-140	L675538-01	WG699441
Acetone	mg/l	0.0742	0.00476	.125	56.0	10-130	L675538-01	WG699441
Acrylonitrile	mg/l	0.157	0.0	.125	130.	49.4-133	L675538-01	WG699441
Benzene	mg/l	0.0220	0.0	.025	88.0	54.3-133	L675538-01	WG699441
Bromochloromethane	mg/l	0.0245	0.0	.025	98.0	66.5-122	L675538-01	WG699441
Bromodichloromethane	mg/l	0.0206	0.0	.025	82.0	63.9-121	L675538-01	WG699441
Bromoform	mg/l	0.0260	0.0	.025	100.	59.5-134	L675538-01	WG699441
Bromomethane	mg/l	0.0168	0.0	.025	67.0	41.7-155	L675538-01	WG699441
Carbon disulfide	mg/l	0.0237	0.0	.025	95.0	43.3-149	L675538-01	WG699441
Carbon tetrachloride	mg/l	0.0226	0.0	.025	90.0	55.7-134	L675538-01	WG699441
Chlorobenzene	mg/l	0.0236	0.0	.025	95.0	67-125	L675538-01	WG699441
Chlorodibromomethane	mg/l	0.0230	0.0	.025	92.0	64.3-125	L675538-01	WG699441
Chloroethane	mg/l	0.0222	0.0	.025	89.0	51.5-136	L675538-01	WG699441
Chloroform	mg/l	0.0221	0.0	.025	88.0	63-129	L675538-01	WG699441
Chloromethane	mg/l	0.0239	0.0	.025	96.0	42.4-135	L675538-01	WG699441
cis-1,2-Dichloroethene	mg/l	0.0230	0.0	.025	92.0	59.2-129	L675538-01	WG699441
cis-1,3-Dichloropropene	mg/l	0.0236	0.0	.025	94.0	66.4-125	L675538-01	WG699441

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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Dibromomethane	mg/l	0.0242	0.0	.025	97.0	68.2-124	L675538-01	WG699441
Ethylbenzene	mg/l	0.0238	0.0	.025	95.0	61.4-133	L675538-01	WG699441
Iodomethane	mg/l	0.109	0.0	.125	87.0	49.7-132	L675538-01	WG699441
Methylene Chloride	mg/l	0.0226	0.0	.025	90.0	58.1-122	L675538-01	WG699441
Styrene	mg/l	0.0245	0.0	.025	98.0	66.8-133	L675538-01	WG699441
Tetrachloroethene	mg/l	0.0242	0.0	.025	97.0	53-139	L675538-01	WG699441
Toluene	mg/l	0.0223	0.0	.025	89.0	61.4-130	L675538-01	WG699441
trans-1,2-Dichloroethene	mg/l	0.0229	0.0	.025	92.0	56.5-129	L675538-01	WG699441
trans-1,3-Dichloropropene	mg/l	0.0246	0.0	.025	99.0	64.1-128	L675538-01	WG699441
trans-1,4-Dichloro-2-butene	mg/l	0.0220	0.0	.025	88.0	57.1-130	L675538-01	WG699441
Trichloroethene	mg/l	0.0234	0.0	.025	94.0	44.1-149	L675538-01	WG699441
Trichlorofluoromethane	mg/l	0.0223	0.0	.025	89.0	49.6-145	L675538-01	WG699441
Vinyl acetate	mg/l	0.122	0.0	.125	98.0	56.1-149	L675538-01	WG699441
Vinyl chloride	mg/l	0.0251	0.0	.025	100.	47.8-137	L675538-01	WG699441
Xylenes, Total	mg/l	0.0667	0.0	.075	89.0	63.3-131	L675538-01	WG699441
4-Bromofluorobenzene					98.70	71-126		WG699441
Dibromofluoromethane					99.60	78.3-121		WG699441
Toluene-d8					103.0	88.5-111		WG699441
a,a,a-Trifluorotoluene					105.0	85-114		WG699441
Ammonia Nitrogen	mg/l	16.5	6.60	10	99.0	90-110	L674754-01	WG699916
1,1,1,2-Tetrachloroethane	mg/l	0.0263	0.0	.025	100.	64-128	L675426-05	WG699945
1,1,1-Trichloroethane	mg/l	0.0285	0.0	.025	110.	58.7-134	L675426-05	WG699945
1,1,2,2-Tetrachloroethane	mg/l	0.0265	0.0	.025	110.	56-132	L675426-05	WG699945
1,1,2-Trichloroethane	mg/l	0.0269	0.0	.025	110.	66.3-125	L675426-05	WG699945
1,1-Dichloroethane	mg/l	0.0297	0.0	.025	120.	58.5-132	L675426-05	WG699945
1,1-Dichloroethene	mg/l	0.0298	0.00368	.025	100.	51.1-140	L675426-05	WG699945
1,2,3-Trichloropropane	mg/l	0.0265	0.0	.025	110.	61.4-128	L675426-05	WG699945
1,2-Dichlorobenzene	mg/l	0.0273	0.0	.025	110.	68.2-123	L675426-05	WG699945
1,2-Dichloroethane	mg/l	0.0283	0.0	.025	110.	60-126	L675426-05	WG699945
1,2-Dichloropropane	mg/l	0.0294	0.0	.025	120.	64.2-123	L675426-05	WG699945
1,4-Dichlorobenzene	mg/l	0.0274	0.0	.025	110.	68.6-123	L675426-05	WG699945
2-Butanone (MEK)	mg/l	0.159	0.0	.125	130.	22.4-138	L675426-05	WG699945
2-Hexanone	mg/l	0.173	0.0	.125	140.*	43.3-137	L675426-05	WG699945
4-Methyl-2-pentanone (MIBK)	mg/l	0.175	0.0	.125	140.	60.8-140	L675426-05	WG699945
Acetone	mg/l	0.141	0.00313	.125	110.	10-130	L675426-05	WG699945
Acrylonitrile	mg/l	0.155	0.0	.125	120.	49.4-133	L675426-05	WG699945
Benzene	mg/l	0.0281	0.0	.025	110.	54.3-133	L675426-05	WG699945
Bromochloromethane	mg/l	0.0268	0.0	.025	110.	66.5-122	L675426-05	WG699945
Bromodichloromethane	mg/l	0.0261	0.0	.025	100.	63.9-121	L675426-05	WG699945
Bromoform	mg/l	0.0260	0.0	.025	100.	59.5-134	L675426-05	WG699945
Bromomethane	mg/l	0.0404	0.0	.025	160.*	41.7-155	L675426-05	WG699945
Carbon disulfide	mg/l	0.0297	0.0	.025	120.	43.3-149	L675426-05	WG699945
Carbon tetrachloride	mg/l	0.0279	0.0	.025	110.	55.7-134	L675426-05	WG699945
Chlorobenzene	mg/l	0.0266	0.0	.025	110.	67-125	L675426-05	WG699945
Chlorodibromomethane	mg/l	0.0249	0.0	.025	100.	64.3-125	L675426-05	WG699945
Chloroethane	mg/l	0.0306	0.0	.025	120.	51.5-136	L675426-05	WG699945
Chloroform	mg/l	0.0285	0.0	.025	110.	63-129	L675426-05	WG699945
Chloromethane	mg/l	0.0287	0.0	.025	120.	42.4-135	L675426-05	WG699945
cis-1,2-Dichloroethene	mg/l	0.0284	0.0	.025	110.	59.2-129	L675426-05	WG699945
cis-1,3-Dichloropropene	mg/l	0.0289	0.0	.025	120.	66.4-125	L675426-05	WG699945
Dibromomethane	mg/l	0.0284	0.0	.025	110.	68.2-124	L675426-05	WG699945
Ethylbenzene	mg/l	0.0282	0.0	.025	110.	61.4-133	L675426-05	WG699945
Iodomethane	mg/l	0.140	0.0	.125	110.	49.7-132	L675426-05	WG699945
Methylene Chloride	mg/l	0.0269	0.0	.025	110.	58.1-122	L675426-05	WG699945
Styrene	mg/l	0.0293	0.0	.025	120.	66.8-133	L675426-05	WG699945

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Est. 1970

Civil & Environmental Consultants - TN
Mr. Michael Johnson
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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Tetrachloroethene	mg/l	0.0253	0.0	.025	100.	53-139	L675426-05	WG699945
Toluene	mg/l	0.0280	0.0	.025	110.	61.4-130	L675426-05	WG699945
trans-1,2-Dichloroethene	mg/l	0.0282	0.0	.025	110.	56.5-129	L675426-05	WG699945
trans-1,3-Dichloropropene	mg/l	0.0284	0.0	.025	110.	64.1-128	L675426-05	WG699945
trans-1,4-Dichloro-2-butene	mg/l	0.0252	0.0	.025	100.	57.1-130	L675426-05	WG699945
Trichloroethene	mg/l	0.0273	0.0	.025	110.	44.1-149	L675426-05	WG699945
Trichlorofluoromethane	mg/l	0.0277	0.0	.025	110.	49.6-145	L675426-05	WG699945
Vinyl acetate	mg/l	0.150	0.0	.125	120.	56.1-149	L675426-05	WG699945
Vinyl chloride	mg/l	0.0287	0.0	.025	120.	47.8-137	L675426-05	WG699945
Xylenes, Total	mg/l	0.0841	0.0	.075	110.	63.3-131	L675426-05	WG699945
4-Bromofluorobenzene					90.20	71-126		WG699945
Dibromofluoromethane					93.50	78.3-121		WG699945
Toluene-d8					99.20	88.5-111		WG699945
a,a,a-Trifluorotoluene					98.40	85-114		WG699945
1,1,1,2-Tetrachloroethane	mg/l	0.0220	0.0	.025	88.0	64-128	L675607-02	WG700087
1,1,1-Trichloroethane	mg/l	0.0222	0.0	.025	89.0	58.7-134	L675607-02	WG700087
1,1,2,2-Tetrachloroethane	mg/l	0.0199	0.0	.025	80.0	56-132	L675607-02	WG700087
1,1,2-Trichloroethane	mg/l	0.0206	0.0	.025	82.0	66.3-125	L675607-02	WG700087
1,1-Dichloroethane	mg/l	0.0224	0.0	.025	90.0	58.5-132	L675607-02	WG700087
1,1-Dichloroethene	mg/l	0.0219	0.0	.025	88.0	51.1-140	L675607-02	WG700087
1,2,3-Trichloropropane	mg/l	0.0211	0.0	.025	84.0	61.4-128	L675607-02	WG700087
1,2-Dichlorobenzene	mg/l	0.0212	0.0	.025	85.0	68.2-123	L675607-02	WG700087
1,2-Dichloroethane	mg/l	0.0226	0.0	.025	90.0	60-126	L675607-02	WG700087
1,2-Dichloropropane	mg/l	0.0229	0.0	.025	92.0	64.2-123	L675607-02	WG700087
1,4-Dichlorobenzene	mg/l	0.0206	0.0	.025	82.0	68.6-123	L675607-02	WG700087
2-Butanone (MEK)	mg/l	0.0849	0.0	.125	68.0	22.4-138	L675607-02	WG700087
2-Hexanone	mg/l	0.0949	0.0	.125	76.0	43.3-137	L675607-02	WG700087
4-Methyl-2-pentanone (MIBK)	mg/l	0.114	0.0	.125	91.0	60.8-140	L675607-02	WG700087
Acetone	mg/l	0.0631	0.00792	.125	44.0	10-130	L675607-02	WG700087
Acrylonitrile	mg/l	0.112	0.0	.125	90.0	49.4-133	L675607-02	WG700087
Benzene	mg/l	0.0210	0.0	.025	84.0	54.3-133	L675607-02	WG700087
Bromochloromethane	mg/l	0.0213	0.0	.025	85.0	66.5-122	L675607-02	WG700087
Bromodichloromethane	mg/l	0.0218	0.0	.025	87.0	63.9-121	L675607-02	WG700087
Bromoform	mg/l	0.0222	0.0	.025	89.0	59.5-134	L675607-02	WG700087
Bromomethane	mg/l	0.0214	0.0	.025	86.0	41.7-155	L675607-02	WG700087
Carbon disulfide	mg/l	0.0199	0.0	.025	80.0	43.3-149	L675607-02	WG700087
Carbon tetrachloride	mg/l	0.0219	0.0	.025	88.0	55.7-134	L675607-02	WG700087
Chlorobenzene	mg/l	0.0210	0.0	.025	84.0	67-125	L675607-02	WG700087
Chlorodibromomethane	mg/l	0.0213	0.0	.025	85.0	64.3-125	L675607-02	WG700087
Chloroethane	mg/l	0.0209	0.0	.025	84.0	51.5-136	L675607-02	WG700087
Chloroform	mg/l	0.0221	0.0	.025	88.0	63-129	L675607-02	WG700087
Chloromethane	mg/l	0.0210	0.0	.025	84.0	42.4-135	L675607-02	WG700087
cis-1,2-Dichloroethene	mg/l	0.0215	0.0	.025	86.0	59.2-129	L675607-02	WG700087
cis-1,3-Dichloropropene	mg/l	0.0224	0.0	.025	90.0	66.4-125	L675607-02	WG700087
Dibromomethane	mg/l	0.0223	0.0	.025	89.0	68.2-124	L675607-02	WG700087
Ethylbenzene	mg/l	0.0218	0.0	.025	87.0	61.4-133	L675607-02	WG700087
Iodomethane	mg/l	0.104	0.0	.125	84.0	49.7-132	L675607-02	WG700087
Methylene Chloride	mg/l	0.0205	0.0	.025	82.0	58.1-122	L675607-02	WG700087
Styrene	mg/l	0.0223	0.0	.025	89.0	66.8-133	L675607-02	WG700087
Tetrachloroethene	mg/l	0.0205	0.0	.025	82.0	53-139	L675607-02	WG700087
Toluene	mg/l	0.0213	0.0	.025	85.0	61.4-130	L675607-02	WG700087
trans-1,2-Dichloroethene	mg/l	0.0206	0.0	.025	82.0	56.5-129	L675607-02	WG700087
trans-1,3-Dichloropropene	mg/l	0.0222	0.0	.025	89.0	64.1-128	L675607-02	WG700087
trans-1,4-Dichloro-2-butene	mg/l	0.0190	0.0	.025	76.0	57.1-130	L675607-02	WG700087
Trichloroethene	mg/l	0.0211	0.0	.025	84.0	44.1-149	L675607-02	WG700087
Trichlorofluoromethane	mg/l	0.0212	0.0	.025	85.0	49.6-145	L675607-02	WG700087
Vinyl acetate	mg/l	0.106	0.0	.125	84.0	56.1-149	L675607-02	WG700087

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Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Vinyl chloride	mg/l	0.0208	0.0	.025	83.0	47.8-137	L675607-02	WG700087
Xylenes, Total	mg/l	0.0648	0.0	.075	86.0	63.3-131	L675607-02	WG700087
4-Bromofluorobenzene					102.0	71-126		WG700087
Dibromofluoromethane					99.50	78.3-121		WG700087
Toluene-d8					101.0	88.5-111		WG700087
a,a,a-Trifluorotoluene					104.0	85-114		WG700087
Sulfate	mg/l	55.3	5.20	50	100.	80-120	L676596-01	WG700401

Analyte	Units	Matrix Spike Duplicate MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Chloride	mg/l	278.	274.	97.2	80-120	1.45	20	L675607-02	WG697964
Nitrate	mg/l	37.4	36.4	102.	80-120	2.71	20	L675607-02	WG697964
Mercury	mg/l	0.00432	0.00432	119.	80-120	0.0	20	L675542-03	WG699123
Aluminum	mg/l	1.02	1.05	99.9	75-125	3.00	20	L675546-07	WG699290
Barium	mg/l	1.05	1.06	105.	75-125	0.0	20	L675546-07	WG699290
Boron	mg/l	0.989	0.988	95.2	75-125	0.0	20	L675546-07	WG699290
Calcium	mg/l	10.8	10.9	105.	75-125	0.0	20	L675546-07	WG699290
Chromium	mg/l	1.04	1.06	104.	75-125	2.00	20	L675546-07	WG699290
Cobalt	mg/l	1.05	1.07	104.	75-125	2.00	20	L675546-07	WG699290
Iron	mg/l	1.06	1.08	103.	75-125	2.00	20	L675546-07	WG699290
Magnesium	mg/l	11.2	11.3	107.	75-125	0.0	20	L675546-07	WG699290
Manganese	mg/l	1.06	1.07	106.	75-125	0.0	20	L675546-07	WG699290
Nickel	mg/l	0.941	0.955	93.7	75-125	2.00	20	L675546-07	WG699290
Potassium	mg/l	9.99	10.5	99.3	75-125	5.00	20	L675546-07	WG699290
Silver	mg/l	0.858	0.878	85.7	75-125	2.00	20	L675546-07	WG699290
Sodium	mg/l	11.7	12.0	101.	75-125	2.00	20	L675546-07	WG699290
Vanadium	mg/l	1.05	1.05	105.	75-125	0.0	20	L675546-07	WG699290
Antimony	mg/l	0.0495	0.0500	99.0	75-125	1.01	20	L675152-03	WG699283
Arsenic	mg/l	0.0470	0.0480	94.0	75-125	2.11	20	L675152-03	WG699283
Beryllium	mg/l	0.0492	0.0499	98.4	75-125	1.41	20	L675152-03	WG699283
Cadmium	mg/l	0.0480	0.0488	96.0	75-125	1.65	20	L675152-03	WG699283
Lead	mg/l	0.0492	0.0488	96.7	75-125	0.816	20	L675152-03	WG699283
Selenium	mg/l	0.0473	0.0492	94.6	75-125	3.94	20	L675152-03	WG699283
Thallium	mg/l	0.0488	0.0476	97.6	75-125	2.49	20	L675152-03	WG699283
Zinc	mg/l	0.0530	0.0536	106.	75-125	1.13	20	L675152-03	WG699283
Antimony	mg/l	0.0525	0.0530	105.	75-125	0.948	20	L675164-02	WG699283
Arsenic	mg/l	0.0510	0.0517	102.	75-125	1.36	20	L675164-02	WG699283
Beryllium	mg/l	0.0527	0.0536	105.	75-125	1.69	20	L675164-02	WG699283
Cadmium	mg/l	0.0539	0.0524	108.	75-125	2.82	20	L675164-02	WG699283
Selenium	mg/l	0.0506	0.0506	101.	75-125	0.0	20	L675164-02	WG699283
Thallium	mg/l	0.0510	0.0514	102.	75-125	0.781	20	L675164-02	WG699283
Zinc	mg/l	0.0558	0.0704	112.	75-125	23.1*	20	L675164-02	WG699283
Copper	mg/l	0.0581	0.0576	116.	75-125	0.864	20	L675164-02	WG699576
1,1,1,2-Tetrachloroethane	mg/l	0.0229	0.0235	91.7	64-128	2.50	20	L675538-01	WG699441
1,1,1-Trichloroethane	mg/l	0.0199	0.0218	79.8	58.7-134	8.87	20	L675538-01	WG699441
1,1,2,2-Tetrachloroethane	mg/l	0.0243	0.0251	97.2	56-132	3.41	22.2	L675538-01	WG699441

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Quality Assurance Report
Level II

January 07, 2014

L675607

Analyte	Units	Matrix Spike Duplicate MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
1,1,2-Trichloroethane	mg/l	0.0239	0.0246	95.7	66.3-125	2.84	20	L675538-01	WG699441
1,1-Dichloroethane	mg/l	0.0215	0.0232	85.8	58.5-132	7.87	20	L675538-01	WG699441
1,1-Dichloroethene	mg/l	0.0219	0.0234	87.8	51.1-140	6.54	20.2	L675538-01	WG699441
1,2,3-Trichloropropane	mg/l	0.0264	0.0273	106.	61.4-128	3.44	22.4	L675538-01	WG699441
1,2-Dichlorobenzene	mg/l	0.0238	0.0247	95.1	68.2-123	3.65	20	L675538-01	WG699441
1,2-Dichloroethane	mg/l	0.0203	0.0216	81.2	60-126	6.30	20	L675538-01	WG699441
1,2-Dichloropropane	mg/l	0.0227	0.0247	90.6	64.2-123	8.58	20	L675538-01	WG699441
1,4-Dichlorobenzene	mg/l	0.0218	0.0232	87.3	68.6-123	6.13	20	L675538-01	WG699441
2-Butanone (MEK)	mg/l	0.120	0.128	95.9	22.4-138	6.95	27	L675538-01	WG699441
2-Hexanone	mg/l	0.137	0.143	110.	43.3-137	4.10	25.5	L675538-01	WG699441
4-Methyl-2-pentanone (MIBK)	mg/l	0.145	0.152	116.	60.8-140	4.63	25.1	L675538-01	WG699441
Acetone	mg/l	0.0705	0.0742	52.6	10-130	5.05	27.9	L675538-01	WG699441
Acrylonitrile	mg/l	0.149	0.157	120.	49.4-133	5.20	25.3	L675538-01	WG699441
Benzene	mg/l	0.0207	0.0220	82.8	54.3-133	6.18	20	L675538-01	WG699441
Bromochloromethane	mg/l	0.0226	0.0245	90.3	66.5-122	8.16	20.8	L675538-01	WG699441
Bromodichloromethane	mg/l	0.0194	0.0206	77.7	63.9-121	5.63	20	L675538-01	WG699441
Bromoform	mg/l	0.0251	0.0260	100.	59.5-134	3.58	20.5	L675538-01	WG699441
Bromomethane	mg/l	0.0168	0.0168	67.4	41.7-155	0.160	21.9	L675538-01	WG699441
Carbon disulfide	mg/l	0.0219	0.0237	87.6	43.3-149	7.78	20.3	L675538-01	WG699441
Carbon tetrachloride	mg/l	0.0217	0.0226	86.8	55.7-134	4.11	20	L675538-01	WG699441
Chlorobenzene	mg/l	0.0222	0.0236	88.9	67-125	6.14	20	L675538-01	WG699441
Chlorodibromomethane	mg/l	0.0223	0.0230	89.1	64.3-125	3.32	20.8	L675538-01	WG699441
Chloroethane	mg/l	0.0204	0.0222	81.7	51.5-136	8.29	40	L675538-01	WG699441
Chloroform	mg/l	0.0207	0.0221	82.9	63-129	6.44	20	L675538-01	WG699441
Chloromethane	mg/l	0.0224	0.0239	89.6	42.4-135	6.36	20	L675538-01	WG699441
cis-1,2-Dichloroethene	mg/l	0.0219	0.0230	87.7	59.2-129	4.61	20	L675538-01	WG699441
cis-1,3-Dichloropropene	mg/l	0.0225	0.0236	89.9	66.4-125	4.85	20	L675538-01	WG699441
Dibromomethane	mg/l	0.0231	0.0242	92.6	68.2-124	4.62	20	L675538-01	WG699441
Ethylbenzene	mg/l	0.0221	0.0238	88.3	61.4-133	7.62	20	L675538-01	WG699441
Iodomethane	mg/l	0.100	0.109	80.2	49.7-132	8.42	20	L675538-01	WG699441
Methylene Chloride	mg/l	0.0209	0.0226	83.6	58.1-122	7.61	20	L675538-01	WG699441
Styrene	mg/l	0.0234	0.0245	93.8	66.8-133	4.62	20	L675538-01	WG699441
Tetrachloroethene	mg/l	0.0224	0.0242	89.7	53-139	7.82	20	L675538-01	WG699441
Toluene	mg/l	0.0210	0.0223	84.1	61.4-130	5.96	20	L675538-01	WG699441
trans-1,2-Dichloroethene	mg/l	0.0209	0.0229	83.4	56.5-129	9.37	20	L675538-01	WG699441
trans-1,3-Dichloropropene	mg/l	0.0236	0.0246	94.2	64.1-128	4.49	20	L675538-01	WG699441
trans-1,4-Dichloro-2-butene	mg/l	0.0213	0.0220	85.2	57.1-130	2.97	23.9	L675538-01	WG699441
Trichloroethene	mg/l	0.0219	0.0234	87.8	44.1-149	6.54	20	L675538-01	WG699441
Trichlorofluoromethane	mg/l	0.0205	0.0223	81.9	49.6-145	8.73	21.2	L675538-01	WG699441
Vinyl acetate	mg/l	0.115	0.122	92.4	56.1-149	5.70	22.7	L675538-01	WG699441
Vinyl chloride	mg/l	0.0236	0.0251	94.4	47.8-137	5.99	20	L675538-01	WG699441
Xylenes, Total	mg/l	0.0626	0.0667	83.4	63.3-131	6.35	20	L675538-01	WG699441
4-Bromofluorobenzene				99.30	71-126				WG699441
Dibromofluoromethane				98.30	78.3-121				WG699441
Toluene-d8				102.0	88.5-111				WG699441
a,a,a-Trifluorotoluene				106.0	85-114				WG699441
Ammonia Nitrogen	mg/l	16.2	16.5	96.0	90-110	1.83	20	L674754-01	WG699916
1,1,1,2-Tetrachloroethane	mg/l	0.0260	0.0263	104.	64-128	1.09	20	L675426-05	WG699945
1,1,1-Trichloroethane	mg/l	0.0289	0.0285	116.	58.7-134	1.36	20	L675426-05	WG699945
1,1,2,2-Tetrachloroethane	mg/l	0.0267	0.0265	107.	56-132	0.570	22.2	L675426-05	WG699945
1,1,2-Trichloroethane	mg/l	0.0265	0.0269	106.	66.3-125	1.77	20	L675426-05	WG699945
1,1-Dichloroethane	mg/l	0.0300	0.0297	120.	58.5-132	0.990	20	L675426-05	WG699945
1,1-Dichloroethene	mg/l	0.0294	0.0298	103.	51.1-140	1.41	20.2	L675426-05	WG699945
1,2,3-Trichloropropane	mg/l	0.0257	0.0265	103.	61.4-128	3.38	22.4	L675426-05	WG699945
1,2-Dichlorobenzene	mg/l	0.0269	0.0273	108.	68.2-123	1.67	20	L675426-05	WG699945

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Mr. Michael Johnson
405 Duke Drive, Suite 270
Franklin, TN 37067

Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Matrix Spike MSD	Duplicate Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
1,2-Dichloroethane	mg/l	0.0283	0.0283	113.	60-126	0.0400	20	L675426-05	WG699945
1,2-Dichloropropane	mg/l	0.0304	0.0294	121.	64.2-123	3.04	20	L675426-05	WG699945
1,4-Dichlorobenzene	mg/l	0.0274	0.0274	110.	68.6-123	0.0600	20	L675426-05	WG699945
2-Butanone (MEK)	mg/l	0.162	0.159	129.	22.4-138	1.42	27	L675426-05	WG699945
2-Hexanone	mg/l	0.167	0.173	133.	43.3-137	3.90	25.5	L675426-05	WG699945
4-Methyl-2-pentanone (MIBK)	mg/l	0.183	0.175	146.*	60.8-140	4.26	25.1	L675426-05	WG699945
Acetone	mg/l	0.144	0.141	113.	10-130	1.98	27.9	L675426-05	WG699945
Acrylonitrile	mg/l	0.157	0.155	125.	49.4-133	0.730	25.3	L675426-05	WG699945
Benzene	mg/l	0.0283	0.0281	113.	54.3-133	0.460	20	L675426-05	WG699945
Bromochloromethane	mg/l	0.0278	0.0268	111.	66.5-122	3.85	20.8	L675426-05	WG699945
Bromodichloromethane	mg/l	0.0266	0.0261	106.	63.9-121	2.11	20	L675426-05	WG699945
Bromoform	mg/l	0.0257	0.0260	103.	59.5-134	0.980	20.5	L675426-05	WG699945
Bromomethane	mg/l	0.0406	0.0404	162.*	41.7-155	0.540	21.9	L675426-05	WG699945
Carbon disulfide	mg/l	0.0301	0.0297	120.	43.3-149	1.52	20.3	L675426-05	WG699945
Carbon tetrachloride	mg/l	0.0282	0.0279	113.	55.7-134	0.910	20	L675426-05	WG699945
Chlorobenzene	mg/l	0.0258	0.0266	103.	67-125	3.07	20	L675426-05	WG699945
Chlorodibromomethane	mg/l	0.0244	0.0249	97.6	64.3-125	1.85	20.8	L675426-05	WG699945
Chloroethane	mg/l	0.0309	0.0306	124.	51.5-136	0.930	40	L675426-05	WG699945
Chloroform	mg/l	0.0288	0.0285	115.	63-129	0.830	20	L675426-05	WG699945
Chloromethane	mg/l	0.0295	0.0287	118.	42.4-135	2.73	20	L675426-05	WG699945
cis-1,2-Dichloroethene	mg/l	0.0287	0.0284	115.	59.2-129	1.22	20	L675426-05	WG699945
cis-1,3-Dichloropropene	mg/l	0.0297	0.0289	119.	66.4-125	2.61	20	L675426-05	WG699945
Dibromomethane	mg/l	0.0295	0.0284	118.	68.2-124	3.77	20	L675426-05	WG699945
Ethylbenzene	mg/l	0.0272	0.0282	109.	61.4-133	3.67	20	L675426-05	WG699945
Iodomethane	mg/l	0.142	0.140	114.	49.7-132	1.60	20	L675426-05	WG699945
Methylene Chloride	mg/l	0.0270	0.0269	108.	58.1-122	0.0200	20	L675426-05	WG699945
Styrene	mg/l	0.0288	0.0293	115.	66.8-133	1.47	20	L675426-05	WG699945
Tetrachloroethene	mg/l	0.0243	0.0253	97.4	53-139	4.04	20	L675426-05	WG699945
Toluene	mg/l	0.0289	0.0280	116.	61.4-130	3.31	20	L675426-05	WG699945
trans-1,2-Dichloroethene	mg/l	0.0286	0.0282	114.	56.5-129	1.37	20	L675426-05	WG699945
trans-1,3-Dichloropropene	mg/l	0.0284	0.0284	114.	64.1-128	0.270	20	L675426-05	WG699945
trans-1,4-Dichloro-2-butene	mg/l	0.0251	0.0252	100.	57.1-130	0.280	23.9	L675426-05	WG699945
Trichloroethene	mg/l	0.0273	0.0273	109.	44.1-149	0.270	20	L675426-05	WG699945
Trichlorofluoromethane	mg/l	0.0277	0.0277	111.	49.6-145	0.0900	21.2	L675426-05	WG699945
Vinyl acetate	mg/l	0.149	0.150	119.	56.1-149	0.820	22.7	L675426-05	WG699945
Vinyl chloride	mg/l	0.0291	0.0287	116.	47.8-137	1.40	20	L675426-05	WG699945
Xylenes, Total	mg/l	0.0820	0.0841	109.	63.3-131	2.57	20	L675426-05	WG699945
4-Bromofluorobenzene				88.20	71-126				WG699945
Dibromofluoromethane				96.40	78.3-121				WG699945
Toluene-d8				99.40	88.5-111				WG699945
a,a,a-Trifluorotoluene				99.40	85-114				WG699945
1,1,1,2-Tetrachloroethane	mg/l	0.0240	0.0220	96.2	64-128	8.73	20	L675607-02	WG700087
1,1,1-Trichloroethane	mg/l	0.0241	0.0222	96.2	58.7-134	7.88	20	L675607-02	WG700087
1,1,2,2-Tetrachloroethane	mg/l	0.0225	0.0199	90.1	56-132	12.3	22.2	L675607-02	WG700087
1,1,2-Trichloroethane	mg/l	0.0235	0.0206	93.8	66.3-125	12.9	20	L675607-02	WG700087
1,1-Dichloroethane	mg/l	0.0243	0.0224	97.2	58.5-132	8.03	20	L675607-02	WG700087
1,1-Dichloroethene	mg/l	0.0236	0.0219	94.4	51.1-140	7.60	20.2	L675607-02	WG700087
1,2,3-Trichloropropane	mg/l	0.0242	0.0211	96.8	61.4-128	13.8	22.4	L675607-02	WG700087
1,2-Dichlorobenzene	mg/l	0.0235	0.0212	93.9	68.2-123	9.98	20	L675607-02	WG700087
1,2-Dichloroethane	mg/l	0.0251	0.0226	100.	60-126	10.2	20	L675607-02	WG700087
1,2-Dichloropropane	mg/l	0.0248	0.0229	99.4	64.2-123	8.17	20	L675607-02	WG700087
1,4-Dichlorobenzene	mg/l	0.0224	0.0206	89.5	68.6-123	8.27	20	L675607-02	WG700087
2-Butanone (MEK)	mg/l	0.0987	0.0849	78.9	22.4-138	15.0	27	L675607-02	WG700087
2-Hexanone	mg/l	0.109	0.0949	87.3	43.3-137	14.0	25.5	L675607-02	WG700087
4-Methyl-2-pentanone (MIBK)	mg/l	0.129	0.114	103.	60.8-140	12.1	25.1	L675607-02	WG700087
Acetone	mg/l	0.0700	0.0631	49.6	10-130	10.3	27.9	L675607-02	WG700087
Acrylonitrile	mg/l	0.126	0.112	100.	49.4-133	11.2	25.3	L675607-02	WG700087

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Est. 1970

Civil & Environmental Consultants - TN
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405 Duke Drive, Suite 270
Franklin, TN 37067

Quality Assurance Report
Level II

L675607

January 07, 2014

Analyte	Units	Matrix Spike MSD	Duplicate Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0231	0.0210	92.3	54.3-133	9.60	20	L675607-02	WG700087
Bromochloromethane	mg/l	0.0235	0.0213	94.0	66.5-122	9.79	20.8	L675607-02	WG700087
Bromodichloromethane	mg/l	0.0239	0.0218	95.6	63.9-121	9.15	20	L675607-02	WG700087
Bromoform	mg/l	0.0242	0.0222	96.6	59.5-134	8.57	20.5	L675607-02	WG700087
Bromomethane	mg/l	0.0226	0.0214	90.4	41.7-155	5.34	21.9	L675607-02	WG700087
Carbon disulfide	mg/l	0.0218	0.0199	87.2	43.3-149	9.24	20.3	L675607-02	WG700087
Carbon tetrachloride	mg/l	0.0236	0.0219	94.5	55.7-134	7.41	20	L675607-02	WG700087
Chlorobenzene	mg/l	0.0226	0.0210	90.5	67-125	7.25	20	L675607-02	WG700087
Chlorodibromomethane	mg/l	0.0240	0.0213	96.2	64.3-125	12.1	20.8	L675607-02	WG700087
Chloroethane	mg/l	0.0221	0.0209	88.5	51.5-136	5.79	40	L675607-02	WG700087
Chloroform	mg/l	0.0241	0.0221	96.2	63-129	8.56	20	L675607-02	WG700087
Chloromethane	mg/l	0.0224	0.0210	89.6	42.4-135	6.49	20	L675607-02	WG700087
cis-1,2-Dichloroethene	mg/l	0.0233	0.0215	93.2	59.2-129	8.21	20	L675607-02	WG700087
cis-1,3-Dichloropropene	mg/l	0.0253	0.0224	101.	66.4-125	12.2	20	L675607-02	WG700087
Dibromomethane	mg/l	0.0245	0.0223	97.8	68.2-124	9.17	20	L675607-02	WG700087
Ethylbenzene	mg/l	0.0233	0.0218	93.2	61.4-133	6.59	20	L675607-02	WG700087
Iodomethane	mg/l	0.114	0.104	90.8	49.7-132	8.28	20	L675607-02	WG700087
Methylene Chloride	mg/l	0.0220	0.0205	88.2	58.1-122	7.20	20	L675607-02	WG700087
Styrene	mg/l	0.0243	0.0223	97.2	66.8-133	8.47	20	L675607-02	WG700087
Tetrachloroethene	mg/l	0.0220	0.0205	88.1	53-139	7.42	20	L675607-02	WG700087
Toluene	mg/l	0.0230	0.0213	92.0	61.4-130	7.70	20	L675607-02	WG700087
trans-1,2-Dichloroethene	mg/l	0.0221	0.0206	88.3	56.5-129	6.75	20	L675607-02	WG700087
trans-1,3-Dichloropropene	mg/l	0.0240	0.0222	96.0	64.1-128	7.60	20	L675607-02	WG700087
trans-1,4-Dichloro-2-butene	mg/l	0.0213	0.0190	85.2	57.1-130	11.7	23.9	L675607-02	WG700087
Trichloroethene	mg/l	0.0233	0.0211	93.2	44.1-149	9.97	20	L675607-02	WG700087
Trichlorofluoromethane	mg/l	0.0229	0.0212	91.7	49.6-145	7.58	21.2	L675607-02	WG700087
Vinyl acetate	mg/l	0.118	0.106	94.7	56.1-149	11.4	22.7	L675607-02	WG700087
Vinyl chloride	mg/l	0.0225	0.0208	90.0	47.8-137	7.70	20	L675607-02	WG700087
Xylenes, Total	mg/l	0.0701	0.0648	93.5	63.3-131	7.83	20	L675607-02	WG700087
4-Bromofluorobenzene				102.0	71-126				WG700087
Dibromofluoromethane				101.0	78.3-121				WG700087
Toluene-d8				101.0	88.5-111				WG700087
a,a,a-Trifluorotoluene				104.0	85-114				WG700087
Sulfate	mg/l	48.1	55.3	85.8	80-120	13.9	20	L676596-01	WG700401

Post Spike

Serial Dilution

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Mr. Michael Johnson
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Franklin, TN 37067

Quality Assurance Report
Level II

L675607

January 07, 2014

Serial Dilution

Batch number /Run number / Sample number cross reference

WG697964: R2871913: L675607-01 02 03 04 05
WG699123: R2872165: L675607-01 02 03 04 05
WG699290: R2872307: L675607-01 02 03 04 05
WG699283: R2872444: L675607-01 02 03 04 05
WG699589: R2872721 R2873782: L675607-01 02 03 04
WG699576: R2872781: L675607-01 02 03 04 05
WG699441: R2873351: L675607-01
WG699916: R2873560: L675607-01 02 03 04 05
WG699945: R2873580: L675607-04 05
WG700087: R2873891: L675607-02 03
WG700401: R2874320: L675607-02

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
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Quality Assurance Report
Level II

L675607

January 07, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

Company Name/Address:

Civil & Environmental Consultants - TN

405 Duke Drive. Suite 270
Franklin.TN 37067

Billing Information:

Mr. Kevin Wolfe
405 Duke Drive, Ste. 270

Franklin,TN 37067

Report to: Mike Johnson

Email to: mjohnson@ceccinc.com

Project Description: EWS-CAMDEN

City/State Collected

Phone: (615) 333-7797
FAX: (615) 333-7751

Client Project #: 101-301

ESC Key: CEC-Customtire

Collected by: (print) MIKE JOHNSON

Site/Facility ID#:

P.O.#:

Collected by (signature):

Immediately Packed on Ice N ~~Y~~

Rush? (Lab MUST Be Notified)
___ Same Day..... 200%
___ Next Day..... 100%
___ Two Day..... 50%
___ Three Day..... 25%

Date Results Needed:

Email? __No__Yes

FAX? __No__Yes

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	Cl, Nitrate, SO4	NH3	API Metals + Al, B, Ca, Fe, K, Mg, Mn, Na	API VOLATILES				Remarks/Contaminant	Sample # (lab only)
MW-1	G	GW		12/23/13	12:30	8	X	X	X	X					L675607-01
MW-3	G	GW			14:30	8	X	X	X	X					02
MW-4	G	GW			1335	8	X	X	X	X					03
Duplicate	G	GW			—	8	X	X	X	X					04
Field Blank	G	GW			1345	5	X	X		X					05
TRIP	—	—		↓	—	1									

Chain of Custody Page 1 of 1

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Phone: (615) 758-5858
Fax: (615) 758-5859

D161

CoCode CEC (lab use only)

Template/Prelogin

Shipped Via:

*Matrix: **SS** - Soil/Solid **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: - NO METALS ON Field blank

pH _____ Temp _____

Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	12/24/13		
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☑ Client

Temp: 2.9 | Bottles Received: 38

Date: 12/24/13 | Time: 0914

Condition: on ice (lab use only)

CoC Seals Intact __ Y __ N __ NA

pH Checked: <2 | NCF: X

ESC
L·A·B S·C·I·E·N·C·E·S

NON-CONFORMANCE FORM

Login No.: L675607

Date: 12/24/13

Evaluated by: Matt S

Client: CEC

Non-Conformance (check applicable items)

- ☐ Parameter(s) past holding time
- ☐ Improper temperature
- ☐ Improper container type
- ☐ Improper preservation
- ☐ Container lid not intact
- X Login Clarification Needed
- ☐ Chain of custody is incomplete
- ☐ Chain of Custody is missing (see below)
- ☐ Broken container(s) (See below)
- ☐ Broken container: sufficient sample volume remains for analysis requested (See below)

If no COC: Received by_____
Date:_____Time:_____
Temp:_____Cont. Rec_____ pH:_____
☐ Fedex ☐ UPS ☐SWA ☐ Other_____
Tracking #_____

- ☐ Insufficient packing material around container
- ☐ Insufficient packing material inside cooler
- ☐ Improper handling by carrier (FedEx / UPS / Courier
- ☐ Sample was frozen

Comments: 1. For ID MW-1, MW-3., MW-4, Duplicate we received 3 40 ml clear vials with no analysis on COC

2. Please clarify remarks on the bottom of the chain

Login Instructions: V8260AP1 and SV8011 ~~per COC~~ **TSR Initials:** __JVH____

Client informed by call / email / fax / voice mail date: 12-23-13___ time: __10:29_____

Client contact:

Please include the EDB and DBCP and V8260AP1

Sent from my iPhone

> On Dec 24, 2013, at 10:36 AM, "John V. Hawkins" <JHawkins@esclabsciences.com> wrote:
>
> For your CEC 101-301 project
>
> When you request AP1 Volatiles are you including SV8011 in your request or just V8260AP1?
>
> Please advise
> John V. Hawkins
> ESC Lab Sciences
> Senior Chemist/Technical Service Representative
> (615) 773-9669 or (615) 758-5858 ext. 9669
> Cell: (615) 519-4793
> jhawkins@esclabsciences.com
>
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> _____
> From: Matt Shacklock
> Sent: Tuesday, December 24, 2013 10:26 AM
> To: John V. Hawkins
> Subject: FW: L675607 CEC NCF
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> _____
> From: Matt Shacklock
> Sent: Tuesday, December 24, 2013 10:25 AM
> To: Jimmy Hunt; Login
> Subject: L675607 CEC NCF
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12-23-13

EWS CAMDEN DEC. 23. 2013 36° OVERCAST

WELL	TD	DTW	WC	V
MW-1	30.50	21.36		
MW-3	27.0	9.57		
MW-4	23.10	9.79	13.31	
MW-2		6.69		

MW-1

V	T	Cond	Do	pH	Orp	Turbidity
0	15.1	88.6	3.51	6.23	60.9	475
1	16.0	89.7	1.54	5.93	7.8	116
2	16.1	110.3	1.30	6.07	2.8	37
3	16.4	121.1	1.34	6.01	5.9	31

12:30 Collect MW-1

1:05 MW-4

V	T	Cond	DO	pH	Orp	Turb
0	14.8	57.1	0.94	6.03	113.6	11
1	15.5	57.3	0.54	6.05	141.6	6
2	15.7	57.2	0.39	5.98	155.7	5
3	15.7	57.2	0.38	5.96	163.2	7

1:35 Collect MW-4 & Duplicate

2:- MW-2

V	T	Cond	DO	pH	Orp
@	11.9	290	2.41	5.88	170.9

215 MW-3

V	T	Cond	DO	pH	ORP	Turb
0	16.9	288.1	0.36	5.80	190.4	26
1	17.2	288.5	0.18	5.75	223.3	19
2	17.2	288.2	0.19	5.74	228.4	18
3	17.2	286.7	0.20	5.75	228.5	19

2:30 Collect MW-3

245 Collect Field Blank @ MW-3

APPENDIX D

CEC STANDARD OPERATING PROCEDURES

03-02-01 MONITORING WELLS USING CONVENTIONAL PURGING

I. SCOPE AND APPLICABILITY: This procedure is applicable to the sampling of monitoring wells which do not contain free product using conventional purge methodology.

II. PROJECT-SPECIFIC REQUIREMENTS

A. SAMPLE LOCATIONS AND NUMBERING SYSTEM:

B. ANALYTICAL PARAMETERS AND SAMPLE FREQUENCY:

C. FIELD SCREENING AND ANALYSES: *Reference appropriate SOPs.*

D. QUALITY ASSURANCE SAMPLES: *Number and type of blanks and duplicates. Reference SOPs 04-01-01, 04-01-02, and 04-02-01 as appropriate.*

E. FILTRATION:

F. PURGE CRITERION AND DISPOSAL OF PURGE WATER:

G. WELL KEYS: *Indicate whether wells use CEC's standard key*

H. DEDICATED EQUIPMENT: *Indicate whether dedicated pumps or bailers have been installed.*

I. OTHER REQUIREMENTS:

III. METHODOLOGY: Monitoring wells should be sampled progressing from least contaminated to most contaminated to reduce the chances of cross contamination between samples. If a bailer is employed, use new rope for each well.

A. PURGING: Purging is performed to remove static water standing in the well bore, thereby allowing collection of a sample representative of water in the aquifer. Unless otherwise specified in Section II.F., well development may suffice for the purge, so long as the sample is collected immediately following development.

1. Measure the water level from the top of the riser pipe at the pre-marked reference point (SOP 06-01-01).

2. Calculate the purge volume using the data presented in Exhibit 03-02-01 and the criterion presented in Section II.F.

3. Remove the required volume of water using one of the following methods. If the well goes dry, the purge can be considered complete unless otherwise specified in Section II.F. However, attempts should be made to prevent the well from going dry during purging, drying the well disrupts the flow regime and can result in the loss of volatile compounds. Therefore:

≅ If a well is known to have a low yield, it should be purged by bailing.

≅ If a pump is used for purging, adjust the pumping rate to maintain a water column in the well, if possible.

≅ Do not attempt to purge a well to dryness unless it is infeasible to maintain water in the well at a reasonable purge rate.

METHOD A: If the purge criterion is specified on volume of water to be removed:

a. Remove the required volume of water using a submersible pump or bailer. If a pump is used, a check valve must be installed on the pump to prevent pumped water from returning to the well. Begin purging at the top of the water column. Minimize aeration of the water during purging by pumping at a low rate or lowering the bailer gently into the water.

b. Lower the pump or bailer as necessary to continue purging until the well volume criterion is met.

METHOD B: If the purge criteria are specified on stabilization of field analyses:

a. Measure initial water quality by retrieving a sample from the top of the water column using a bailer. Conduct the field analyses specified in Section II.F. Record these results on the Groundwater Monitoring Data Sheet (SOP 07-02-01).

b. Remove one well volume of water by submersible pump or bailer. If a pump is used, a check valve must be installed to prevent water from returning to the well. Begin purging at the top of the water column. Minimize aeration of the water during purging by pumping at a low rate or lowering the bailer gently into the water.

c. After one well volume has been removed, conduct field analyses on the groundwater being discharged. Record results on the Monitoring Sampling Data Sheet.

d. Repeat steps b and c until the purge criteria have been met.

B. SAMPLE COLLECTION: Groundwater samples should be collected immediately after purging , if the well will yield sufficiently. Some low-yielding wells may require time to recover prior to sampling. If the well will not yield a sample immediately after purging, a maximum of 24 hours between purging and sampling is permitted.

1. Collect water from the well by slowly lowering a decontaminated bailer into the water column.

2. Transfer the samples which do not require filtering directly into sample bottles in the following order:

Volatile Organic Compounds
Semi-Volatile Organic Compounds
Pesticides and PCBs
Cations and Anions
Radionuclides
Bacteria.

3. If indicated in Section II.E., filter the required aliquots (SOP 05-03-02 or 05-03-03) and fill those sample bottles.

4. Preserve the samples immediately in accordance with SOP 07-01-02.

5. Conduct field analyses: pH (SOP 05-04-01 or 05-04-04), temperature, specific conductance (SOP 05-04-02), dissolved oxygen (SOP 05-04-03), Eh (SOP 05-04-08), and any other parameters listed in Section II.C.

6. If a dedicated sample bailer was used, return it to the well head. Otherwise, decontaminate the bailer as specified in SOP 01-01-00.

7. Replace the well cap and lock the protective casing.

8. Collect quality-assurance samples specified in Section II.D in accordance with SOP 04-01-01, 04-01-02, and 04-02-01.

9. Decontaminate samples in accordance with SOP 01-01-00.

10. Pack and ship the samples in accordance with SOP 07-01-03. Samples should be shipped on a daily basis and such that holding time requirements (SOP 07-01-02) can be met.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. When using a bailer, do not allow the rope to drag on the ground. If necessary, lay out plastic sheeting to catch the rope.

B. When using a pump, exercise caution to prevent cross-contaminating samples with the hose. Do not sample from the pump discharge for trace organic compounds. Always use a check valve if not using a dedicated hose. Discard hose if there is a question about whether it can be adequately decontaminated.

C. Check the holding times on the analyses to be conducted. The holding time for some parameters is 24 hours. Plan sampling and shipping of these samples accordingly.

D. Preserve samples immediately after collection, including keeping them cool. Do not let samples sit in a hot vehicle until the end of the day.

V. DOCUMENTATION

A. Record information on a Groundwater Monitoring Data Sheet (SOP 07-02-01).

B. Prepare a Trip Report (SOP 07-02-04) and include:

- ≅ Time, date, and method of sample shipment
- ≅ Preservation methods and sample handling
- ≅ Description of purge and sampling methods
- ≅ The Groundwater Monitoring Data Sheet.

VII. REFERENCES

None

04-01-01 EQUIPMENT BLANKS

I. SCOPE AND APPLICABILITY: Equipment blanks are collected to assess the adequacy of decontamination procedures and to determine whether sampling equipment and methods are contributing contaminants to samples.

II. PROJECT-SPECIFIC REQUIREMENTS:

WATER TYPES TO BE USED FOR BLANKS: *[distilled water, deionized water, HPLC-grade water, etc.]*

III. METHODOLOGY

A. Review the SOP for the medium sampled to establish the frequency for collection of blanks.

B. Assemble a complete set of decontaminated sampling equipment for the subject sampling effort.

C. Rinse the blank water across the sampling equipment, catching it in a decontaminated stainless-steel bucket. Handle the water in the same manner as the samples. For example, if samples for metals analysis are to be filtered with a disposable filter, the blank aliquot for metals analysis should be processed through a new disposable filter. Blanks for soil sampling may be run across the split-spoon sampler, trowel, and bucket.

D. Fill a complete set of sample bottles.

E. Assign the blank a sample number of the same format as the other samples in the series.

F. Store, handle, and ship the blanks in the same manner as the samples.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. The selection of stock solution depends upon the requirements of the project. Analyses for trace contaminants will require a purer blank solution than analyses for major constituents. Stringent analytical requirements will necessitate the use of laboratory-supplied blank water.

B. Include ALL sampling equipment in the rinsing procedure.

V. DOCUMENTATION: Record the following information in the field logbook:

- ≅ Source of blank water
- ≅ Time and sequence within the sampling event when the blanks were prepared
- ≅ Description of the procedure for preparing the blanks
- ≅ Sample numbers assigned to blanks.

Incorporate this information into the Trip Report (SOP 07-02-04).

VI. REFERENCES

EPA, 1986. Test Methods for Evaluating Solid Waste: SW-846; Volume II. Washington, DC.

04-01-02 TRIP BLANKS

I. SCOPE AND APPLICABILITY: Trip blanks are prepared to evaluate whether volatile constituents have migrated into samples from the air on-site, during shipping, or at the laboratory.

II. PROJECT-SPECIFIC REQUIREMENTS:

A. Frequency:

B. Other Criteria:

III. METHODOLOGY

A. When ordering bottles from the laboratory for the sampling event, request that trip blanks be sent also.

B. Keep the supplied blanks with the samples being collected throughout the sampling event. Handle the blanks in the same manner as the filled sample vials.

C. Assign the trip blank a sample number of the format used for the sampling event.

D. Return the trip blanks to the laboratory with the samples. Include the samples on the Chain-of-Custody form (SOP 07-02-02). Analysis is typically performed for volatile organic compounds only.

IV. PRECAUTIONS AND COMMON PROBLEMS: None.

V. DOCUMENTATION: Describe handling on the trip blanks in the Trip Report (SOP 07-02-04). Include the sample numbers assigned.

VI. REFERENCES

EPA, 1986. Test Methods for Evaluating Solid Waste: SW-846; Volume II. Washington, DC.

04-02-01 LIQUID DUPLICATES

I. SCOPE AND APPLICABILITY: Duplicate samples are collected to evaluate the precision involved in the sampling effort. Duplicate samples must be collected to be as similar as possible to the original sample. This procedure is applicable of collection of duplicate samples of all liquids and flowable sludges.

II. PROJECT-SPECIFIC REQUIREMENTS:

NUMBER/FREQUENCY OF DUPLICATE SAMPLING:

DUPLICATE NUMBERING SYSTEM: *[Indicate how sample numbers are to be assigned to duplicates, and whether "blind" numbers should be assigned.]*

III. METHODOLOGY

A. Prepare sample bottles for the target sample and its duplicate.

B. Collect the liquid sample in accordance with the appropriate SOP.

C. When filling sample bottles, fill each type of bottle for the sample and duplicate in sequence. Fill both VOA vials, then both metals bottles, etc. This will assure that the duplicate is as similar to the original sample as possible.

D. Preserve the sample and duplicate identically.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. Failure to fill bottles alternately between the sample and duplicate may result in poor reproducibility between analyses.

B. Samples with free product or multiple phases present special problems. The phase distribution must be the same in both aliquots.

V. DOCUMENTATION: List the sample and duplicate on the Groundwater Monitoring Data Sheet as separate samples, describing the duplicate in the "Comments" column. If a Groundwater Monitoring Data Sheet is not appropriate, incorporate this information into the Trip Report (SOP 07-02-04).

VI. REFERENCES: None.

05-03-05 BAILER

I. EQUIPMENT SPECIFICATION: This procedure is applicable to the use of all bottom-fill bailers.

II. INSPECTION AND CALIBRATION

A. DAILY INSPECTION AND CHECKS: Make sure fittings at both ends of the bailer are secure. Assure that the check valve opens and closes freely.

B. CALIBRATION: There is no calibration applicable to this equipment.

C. ROUTINE MAINTENANCE: There is no maintenance applicable to this equipment. Bailers are typically replaced if damaged.

III. USE

A. Select a rope or cable for suspension of the bailer which is appropriate to project requirements. Typically, small gauge nylon rope is used, although stainless-steel cable may be used when samples will be analyzed to very low detection limits. The rope or cable should be new and clean. Do not use materials which have been used on another project, as this may result in cross contamination.

B. Consult the Project Manager to select a bailer composition which is compatible with the anticipated groundwater quality. For most applications, PVC bailers are adequate. Stainless-steel may be used where very low levels of organic compounds are of interest. Teflon bailers are available and may be requested on some projects.

C. Using a strong, non-slipping knot, such as a bowline, tie the rope or cable to the top of the bailer.

D. Lower the bailer into the well. Do not let the bailer free-fall down the well, as the device may shatter or the ball valve may become dislodged upon striking the water or the bottom of the well.

E. Raise the bailer by pulling the rope with a smooth, uniform motion. A jerky motion may open the check valve, resulting in water loss. Check the knot periodically.

Do not allow the bailer rope to drag on the ground. Place plastic sheeting on the ground to keep the rope clean if conditions are muddy, the ground surface is contaminated, or very low levels of contaminants are of interest.

IV. DECONTAMINATION: The equipment should be decontaminated in accordance with SOP 01-01-00.

Typically, the bailer is washed with a potable water and non-phosphate soap solution. The bailer is then rinsed with distilled water and wrapped in plastic or foil until used.

V. TROUBLESHOOTING

A. If the knot should come undone or the rope breaks, the bailer typically can be recovered using a weighted fishing hook tied to monofilament line.

B. When bailing turbid water, it may be necessary to rinse the ball-valve at the bottom of the bailer with distilled water if it clogs.

06-01-01 WATER-LEVEL MEASUREMENT IN MONITORING WELLS

I. SCOPE AND APPLICABILITY: This procedure is applicable to the measurement of water levels in monitoring wells and open boreholes.

II. PROJECT-SPECIFIC REQUIREMENTS

A. REQUIRED READINGS:

B. APPLICABLE METHODS:

III. METHODOLOGY: Water levels should always be recorded to ±0.01 foot. Measurements should be made from a marked point on the inner casing for monitoring wells, and from the ground surface for open boreholes. Equipment should be decontaminated in accordance with SOP 01-01-00 after each measurement. The following methods may be used:

A. CHALKED-TAPE METHOD

1. Check records for historic water levels in the well, if available.

2. Rub the first five feet of a steel surveyor's chain or fiberglass tape with carpenter's chalk.

3. Lower the tape into the well until the end of the tape enters the water.

4. Record the tape footing at the wellhead to within 0.01 feet.

5. Pull the tape out of the well and read the tape footage of the water mark to within 0.01 feet. The difference between the readings is the water level.

B. SOUNDING

1. Attach a small float or hollow-bottom weight or sounder to the end of a tape measure.

2. Lower the sounder into the well and listen for the sound of the weight hitting the water surface.

3. When this is heard, pull the sounder back a few inches and redrop it by 1/4-inch increments until the sound is heard again.

4. Subsequent smaller increments of lowering the sounder will allow water-level measurements to within 0.01 feet.

5. Measure the length from the zero mark on the tape measure to the bottom of the weight. Add this value to all field measurements made with the sounder.

C. ELECTRIC-WATER LEVEL METER (Solinst)

1. Turn the Solinst on by turning the knob clockwise. This knob is also the volume control. Test the Solinst to see if the battery is dead by pushing the button next to the volume knob.If the battery is charged the Solinst will emit an audible tone and the red indicator light will illuminate.
2. Lower the end of the probe into the well or borehole. The probe will cause the unit to emit the tone and illuminate the light when it contacts water.

3. Pull the probe back a few inches and lower the probe in smaller increments until the water level is measured to within 0.01 feet.

4. The water level is read directly from the Solinst tape, and already includes a correction for the length of the probe on the bottom of the tape.

D. INTERFACE PROBE: This is the only reliable method for wells with floating free product.

1. Push the On/Off button to turn unit on. Lower the probe into the liquid. The horn will sound a steady tone and the yellow light will illuminate when the probe contacts an oil product. Slowly raise probe until sound stops, lower until sound is heard again to refine the oil level.

2. Read the tape marking and note as the surface level of product.

3. Slowly lower the probe through the oil product, searching for the oil-water interface. When the probe reaches water the tone will switch from steady to a beeping tone and the red light will illuminate. Slowly move probe up and down to refine the oil/water interface to within 0.01 feet. Read the water level directly from the tape. The length of the probe is already considered.

NOTE: Auto Shutoff Feature: After approximately five minutes of power on, the unit will auto-shut off. A chirping sound will be heard, warning impending shut off. Press

<POWER ON/RENEW> to continue operation. During five minute interval, short "alive" beep is heard.

IV. PRECAUTIONS AND COMMON PROBLEMS:

1. Be sure to allow sufficient time after development, purging or pumping to allow the well to recover to static conditions.

2. Sounding may be difficult with very deep water levels or in noisy conditions because the sound is hard to hear.

3. Measurement of water levels in pumping wells or wells/boreholes with cascading water can be difficult. Installing a narrow PVC access tube inside the well casing can make obtaining accurate readings easier.

4. Free product floating on the water table depresses the natural water level. If a true water level is required, the product of the oil thickness and the oil specific gravity must be added to the oil/water interface elevation.

5. If there is no measurement mark on the well riser, add one in indelible ink.

V. DOCUMENTATION

1. Record water levels in a field notebook or Groundwater Monitoring Data Sheet (SOP 07-02-01). Be sure to record the date and time of the measurement.

2. Data should be incorporated into the Trip Report (SOP 07-02-04). Method of measurement should be reported.

VI. REFERENCES: None

07-01-01 MAINTAINING SAMPLE CHAIN OF CUSTODY

I. SCOPE AND APPLICABILITY: This procedure is to be employed whenever samples are collected for laboratory analysis, and is designed to ensure that sample integrity is maintained. These procedures are necessary to assure that samples are defensible.

II. PROJECT-SPECIFIC REQUIREMENTS: None.

III. METHODOLOGY

A. SAMPLE CUSTODY: The sampling personnel must maintain custody of the samples until they are delivered to the laboratory, at which time the laboratory takes over the custody record. A sample is considered to be in custody if:

- it is in the investigator's actual possession
- it is in view of the investigator
- it has been placed in a secure area
- a signed custody seal has been placed on the sample container such that the seal would be destroyed if the container was opened.

B. CUSTODY RECORD

1. Complete a Chain-of-Custody Form for each shipping container of samples as described in SOP 07-02-02. Place the white copy of the completed form in the shipping container with the samples, as discussed in SOP 07-01-03.

2. Affix a signed custody seal to secure all samples. Seals may be placed across the lids of individual sample bottles, or on each shipping container of samples. If seals are placed on shipping containers, at least two seals must be used, and they must be placed such that the container cannot be opened without breaking the seals.

IV. PRECAUTIONS AND COMMON PROBLEMS

A. It may be necessary to cover custody seals with clear postal tape to prevent them from falling off.

B. Deliver or fax a copy of the custody form to the Project Manager within 24 hours of shipping the samples so that any errors can be corrected before the laboratory begins processing the samples.

V. DOCUMENTATION

A. The pink copy of the Chain-of-Custody Form should be submitted to the Project Manager as soon as possible after the samples are shipped.

B. The Project Manager or a designee must review the form for completeness and correctness. Any errors should be flagged, and the laboratory should be contacted if errors could affect analysis. The reviewer should initial and date the form, then place it in the Project File.

C. Compliance or problems with custody procedures should be documented in the Trip Report (SOP 07-02-04).

VI. REFERENCES

EPA Region IV; 1991. Environmental Compliance Branch, Standard Operating Procedures and Quality Assurance Manual. Athens, Georgia.

07-02-01 GROUNDWATER MONITORING DATA SHEET

I. SCOPE AND APPLICABILITY: A Groundwater Monitoring Data Sheet is completed each time water samples are collected to document field data and sampling methodology.

II. PROJECT-SPECIFIC REQUIREMENTS: None.

III. METHODOLOGY: Complete the form (Exhibit 07-02-01) as samples are collected, as follows:

a. Self explanatory
b. CEC project number
c. Names or initials of all members of the sampling team
d. Complete well designation
e. Depth to water level, reported to $\pm$0.01 ft. (Check measurement datum at the top of the column.)
f. Date and time well purging is started
g. Volume of water removed, in gallons
h. Check if well was purged to dryness
i. Indicate method of purging, such as submersible pump or bailer
j. Date and time that the actual sample was withdrawn. If sample bottles were filled at multiple, separate times, these should all be indicated.
k. Self explanatory (Check units for temperature.)
l. Unusual odors or other observations
m. Other atypical information, such as special handling of purge water or field problems

IV. PRECAUTIONS AND COMMON PROBLEMS: All information required by the form must be provided.

V. DOCUMENTATION: Attach the form to the Trip Report (SOP 07-02-04).

VI. REFERENCES: None.