Data Validation Package

November 2013
Water Sampling at the Bluewater, New Mexico, Disposal Site

February 2014

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Bluewater, New Mexico, Disposal Site

Sampling Period: November 19-21, 2013

Groundwater samples were collected from monitoring wells at the Bluewater, New Mexico, Disposal Site to monitor groundwater contaminants as specified in the 1997 *Long-Term Surveillance Plan for the DOE Bluewater (UMTRCA Title II) Disposal Site Near Grants, New Mexico* (LTSP). Sampling and analyses were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04325, continually updated). Duplicate samples were collected from locations 15(SG) and 21(M).

Alluvium wells are completed in the alluvial sediments in the former channel of the Rio San Jose, which was covered by basalt lava flows known as the El Malpais, and are identified by the suffix (M). Bedrock wells are completed in the San Andres Limestone/Glorieta Sandstone hydrologic unit and are identified by the suffix (SG). Wells HMC-951 and OBS-3 are also completed in the San Andres/Glorieta aquifer.

The LTSP requires monitoring for molybdenum, selenium, uranium, and polychlorinated biphenyls (PCBs); PCB monitoring occurs only during November sampling events. This event included sampling for an expanded list of analytes to support a regional groundwater investigation being conducted by the New Mexico Environment Department.

Alluvium Monitoring Wells

Alluvium wells 21(M) and 22(M) were installed downgradient of point-of-compliance (POC) well T(M) in summer 2011; well 21(M) is located near the site boundary where alluvial groundwater apparently leaves the site. These wells were installed in response to the exceedance of the alternate concentration limit (ACL) for uranium in well T(M) during previous sampling events.

Alluvium wells 20(M) and 23(M) were installed in summer 2012 to further characterize the alluvial aquifer. Well 20(M) is located near the west site boundary where alluvial groundwater enters the site. Well 23(M) is downgradient of well 21(M) and is located near the site entrance. This well was dry at the time of construction and for the first sampling event, but since then has had sufficient water to sample. Well T(M) was also scheduled for sampling but continues to be dry.

Analytical results for the required constituents for the alluvium wells are provided in Table 1. The uranium concentration was 0.137 milligram per liter (mg/L) in well 21(M), and was 0.145 mg/L in point-of-exposure (POE) well X(M); these results exceed the Uranium Mill Tailings Radiation Control Act (UMTRCA) maximum concentration limit (MCL) of 0.044 mg/L (40 CFR 192, Table 1). Therefore, alluvial groundwater with elevated uranium is leaving the site; this occurrence is being evaluated by DOE in consultation with the U.S. Nuclear Regulatory Commission. The extent of contamination in the alluvial aquifer is not known at this time.

However, the uranium concentration in well 23(M), located about 1,600 feet downgradient of well 21(M), was 0.0209 mg/L. PCBs have never been detected in any of the wells at the site and were not detected in any samples during this event.

Table 1. November 2013 Groundwater Monitoring Analytical Results for the Alluvium Wells

Location	Category	Molybdenum (mg/L) ACL=0.10 mg/L	Selenium (mg/L) ACL=0.05 mg/L	Uranium (mg/L) ACL=0.44 mg/L
20(M)	Upgradient	0.0025	0.0038	0.0139
21(M)	Downgradient	0.0015	0.0101	0.1370
22(M)	Downgradient	0.0010	0.0037	0.3880
23(M)	Downgradient	0.0075	0.0028	0.0209
E(M)	Background	0.0006	ND	ND
F(M)	POC	0.0014	ND	0.0073
T(M)	POC	Not Sampled	Not Sampled	Not Sampled
X(M)	POE	0.0018	0.0066	0.1450
Y2(M)	PCBs	0.0026	ND	0.0053

Key: ACL = alternate concentration limit; mg/L = milligrams per liter; ND = not detected;
PCBs = polychlorinated biphenyls well; POC = point-of-compliance well; POE = point-of-exposure well

Bedrock Monitoring Wells

Bedrock wells 11(SG), 13(SG), 14(SG), 15(SG), 16(SG), and 18(SG) were installed in summer 2012 to gain a better understanding of the hydrogeological characteristics of the San Andres/ Glorieta aquifer at the site, and because a nearby offsite private well (HMC-951) completed in the same aquifer indicated elevated uranium concentrations. There were no bedrock wells in the south portion of the site prior to this well construction project. Wells 11(SG) and 14(SG) are considered to be crossgradient of the disposal cells, and all of the other new wells are downgradient of the cells. Well 16(SG) was installed between POC wells OBS-3 and S(SG) because of the poor condition of those wells (their well screens are highly corroded). Wells OBS-3 and S(SG) continue to be sampled.

Bedrock wells I(SG) and L(SG) were completed with open-hole construction through the entire thickness of the San Andres Limestone and Glorieta Sandstone formations. All of the new San Andres/Glorieta aquifer wells onsite, except well 16(SG), are screened in the upper 50 feet of the San Andres Limestone as are most San Andres/Glorieta aquifer wells in the region because this is the most productive zone of the aquifer (well 16(SG) is screened in the Glorieta Sandstone because the San Andres Limestone is dry at that location). In response to questions by New Mexico Environment Department about the possibility of stratification of contamination within the aquifer, downhole conductivity was measured in wells I(SG) and L(SG) in spring 2013. No change in conductivity with depth was observed in background well L(SG). However, three zones of different conductivities were noted in POE well I(SG). In well I(SG), low-flow samples were collected in three zones at depths of 240, 265, and 300 feet, and another sample was collected after three columns of water were purged from the well (the submersible pump intake was inside the well casing at a depth of 210 feet).

Offsite private well HMC-951, located near the site entrance and used only for monitoring purposes, was sampled by DOE for the first time during this event. A blockage near the bottom of the well casing prevented installation of a low-flow sampling pump in the open hole portion of the well. Consequently, the samplers installed a submersible pump inside the well casing at a depth of 180 feet and collected a sample after three columns of water were purged from the well.

Analytical results for the required constituents in bedrock wells are provided in Table 2. The selenium and uranium concentrations did not exceed ACLs in the POC wells. However, the uranium concentrations in downgradient wells 13(SG) and 18(SG), located along the site boundary, continue to exceed the UMTRCA MCL. Uranium concentrations at all sampled depths in POE well I(SG) also exceeded the MCL. The uranium concentration in HMC-951 exceeded the New Mexico drinking water standard of 0.03 mg/L. Therefore, San Andres/Glorieta aquifer groundwater with elevated uranium is leaving the site; this occurrence is being evaluated by DOE in consultation with the U.S. Nuclear Regulatory Commission.

Table 2. November 2013 Groundwater Monitoring Analytical Results for the Bedrock Wells

Location	Category	Selenium (mg/L) ACL=0.05 mg/L	Uranium (mg/L) ACL=2.15 mg/L
11(SG)	Downgradient	ND	0.0117
13(SG)	Downgradient	0.0050	0.0985
14(SG)	Upgradient	ND	0.0741
15(SG)	Downgradient	0.0023	0.1740
16(SG)	Downgradient	0.0147	1.400
18(SG)	Downgradient	0.0018	0.1270
HMC-951	Offsite	ND	0.0313
I(SG) 300 feet	POE	0.0087	0.3240
I(SG) 265 feet	POE	0.0084	0.3340
I(SG) 240 feet	POE	ND	0.1490
I(SG) 210 feet	POE	0.0077	0.3460
L(SG)	Background	ND	0.0029
OBS-3	POC	ND	0.0093
S(SG)	POC	0.0090	0.5250

Key: ACL = alternate concentration limit; mg/L = milligrams per liter; ND = not detected; POC = point-of-compliance well; POE = point-of-exposure well

Richard K. Johnson
Site Lead, S.M. Stoller Corporation

2/10/14
Date

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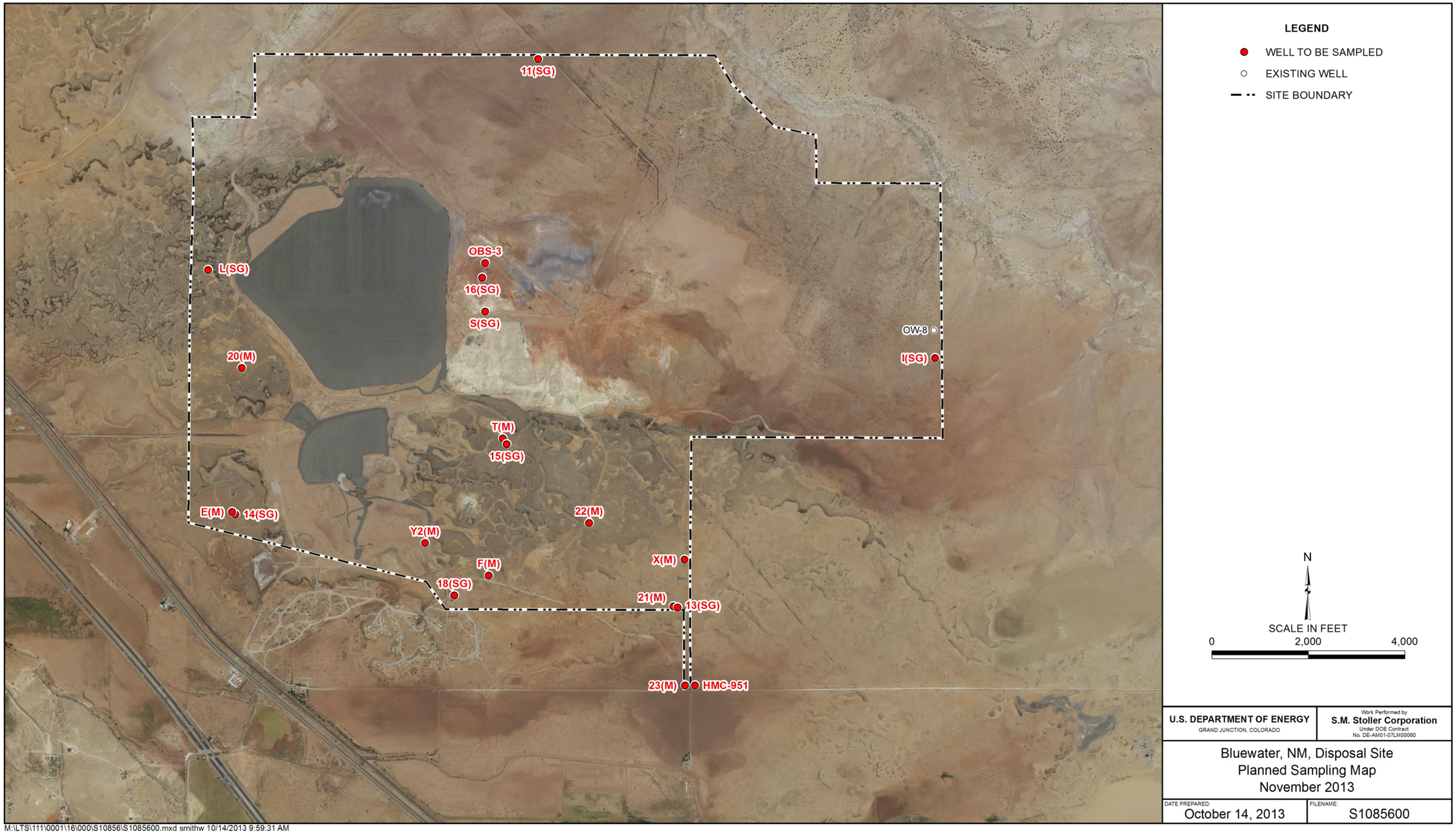

Bluewater, New Mexico, Disposal Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Bluewater, NM, Disposal Site	**Date(s) of Water Sampling**	November 19-21, 2013
Date(s) of Verification	January 28, 2014	**Name of Verifier**	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List any Program Directives or other documents, SOPs, instructions.		Program Directive BLU-2013-01. Work Order letter dated October 14, 2013.
2. Were the sampling locations specified in the planning documents sampled?	No	Location T(M) was dry.
3. Were calibrations conducted as specified in the above-named documents?	Yes	There were two typos on the calibration sheets (for a pH mV value and for an expiration date). The calibrations were performed correctly, and no data were adversely affected.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	No	An alkalinity value was inadvertently not recorded at one location.
6. Were wells categorized correctly?	No	Some high-flow wells were mis-categorized as Cat I or II wells in the field notes.
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Was all pertinent information documented on the field data sheets?	No	The sampling equipment was not documented at one location.
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	13115746
Sample Event:	November 19-21, 2013
Site(s):	Bluewater, New Mexico
Laboratory:	GEL Laboratories, Charleston, South Carolina
Work Order No.:	338107
Analysis:	Metals, Organics, Wet Chemistry, and Radiochemistry
Validator:	Gretchen Baer
Review Date:	January 28, 2014

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Arsenic, Molybdenum, Selenium, Uranium	LMM-02	SW-846 3005A	SW-846 6020
Calcium, Magnesium, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Chloride, Sulfate	MIS-A-045	EPA 300.0	EPA 300.0
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Polychlorinated Biphenyls (PCBs)	PEP-A-006	SW-846 3535A	SW-846 8082
Total Dissolved Solids (TDS)	WCH-A-033	SM 2540C	SM 2540C
Uranium Isotopes	ASP-A-024	HASL-300, U-02-RC Mod	HASL-300, U-02-RC Mod

Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to the sections below for an explanation of the data qualifiers applied.

Table 4. Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
338107-006	18(SG)	Uranium-235	J	Less than the Determination Limit
338107-007	20(M)	Uranium-235	J	Less than the Determination Limit
338107-011	23(M)	Uranium-235	J	Less than the Determination Limit
338107-016	HMC-951	TDS	J	Exceeded weighback criteria
338107-021	L(SG)	Uranium-235	U	Less than the Decision Level Concentration
338107-022	OBS-3	Uranium-235	U	Less than the Decision Level Concentration
338107-024	X(M)	Potassium	J	Serial dilution result

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received 24 water samples on November 22, 2013, accompanied by a Chain of Custody form. The air bill numbers were listed in the receiving documentation. The Chain of Custody form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody form was complete with no errors or omissions, with the following exception. The sample date was written incorrectly on the Chain of Custody for sample X(M). The error was corrected upon entry into the environmental database.

On December 2, 2013, the laboratory was requested to add isotopic uranium analysis to all locations for this RIN using the excess sample from the metals aliquots.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced coolers at 2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all metal, organic, and wet chemical analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL.

For radiochemical analytes (those measured by radiometric counting) the MDL and PQL are not applicable, and these results are evaluated using the minimum detectable concentration (MDC), Decision Level Concentration (DLC), and Determination Limit (DL). The MDC is a measure of radiochemical method performance and was calculated and reported as specified in *Quality Systems for Analytical Services*. The DLC is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, and is estimated as 3 times the one-sigma total propagated uncertainty. Results that are greater than the MDC, but less than the DLC are qualified with a “U” flag (not detected). The DL for radiochemical results is the lowest concentration that can be reliably measured, and is defined as 3 times the MDC. Results not previously “U” qualified that are less than the DL are qualified with a “J” flag as estimated values.

The reported MDLs for all metal, organic, and wet chemical analytes, and MDCs for radiochemical analytes demonstrate compliance with contractual requirements. Some samples were diluted prior to analysis of arsenic and selenium to reduce interferences, resulting in elevated detection limits.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method EPA 300.0
Calibrations for chloride and sulfate were performed using seven calibration standards on August 19, 2013. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria.

Method EPA 353.2
Calibrations for nitrate + nitrite as N were performed using six calibration standards on December 9 and 17, 2013. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration check results were within the acceptance criteria.

Method SW-846 6010B
Calibrations for calcium, magnesium, potassium, and sodium were performed on December 4 and 12, 2013, using three calibration standards. The correlation coefficient values were greater than 0.995. The absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range, with the following exceptions. Some sodium and potassium check results were outside the acceptance range. All affected results were greater than 5 times the PQL, so no qualification is necessary.

Method SM 2540C
There are no initial or continuing calibration requirements associated with the total dissolved solids method. The laboratory noted that some samples failed the weight check criterion of 0.0005 gram. However, (with the exception of the weights for location HMC-951) these weights were within 4 percent so no further qualification is necessary. The total dissolved solids result for HMC-951 is qualified with a “J” flag as an estimated value.

Method SW-846 6020A
Calibrations were performed for arsenic, molybdenum, selenium, and uranium on December 12 and 16–18, 2013, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the calibration curve intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the

required frequency. All calibration checks associated with reported results met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 8082
The initial calibrations for PCBs were performed using five calibration standards on December 5, 2013. Calibration curves were established using the calibration factor (CF) approach. The relative standard deviations for the CFs were less than 20 percent. Initial and continuing calibration verification checks were made at the required frequency. All checks met the acceptance criteria with these exceptions: an Aroclor-1016 peak (column 1) and two Aroclor-1260 peaks (column 1) were slightly above the range; however, the average concentration of the five quantified peaks met the acceptance criteria and no reported results were associated with these checks. PCBs were not detected in any field sample.

Radiochemical Analysis

Alpha spectrometry calibrations and instrument backgrounds were performed within a month prior to sample analysis. Calibration standards were counted to obtain a minimum of 10,000 counts per peak. Daily instrument checks met the acceptance criteria. The tracer recoveries met the acceptance criteria of 30 to 110 percent for all samples. The full width at half maximum was reviewed to evaluate the spectral resolution. All internal standard full width at half maximum values were below 100 kiloelectron volts, demonstrating acceptable resolution. All internal standard peaks were within 50 kiloelectron volts of the expected position. The regions of interest for analyte peaks were reviewed. No manual integrations were performed and all regions of interest were satisfactory. All results were blank-corrected using data from a blank population.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis.

Metals and Wet Chemistry
All method blank and calibration blank results were below the PQL for all analytes. In cases where a blank concentration exceeds the MDL, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the MDL but less than 5 times the blank concentration. (The molybdenum detects in some method blanks were bracketed by calibration blanks with detected molybdenum; no sample results require qualification.)

Organics
The method blank results were below the MDL for all target compounds.

Radiochemistry
The radiochemistry method blank results were less than the DLC.

Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike. The spike recoveries met the acceptance criteria for all analytes evaluated. (Some spike recoveries of chloride and sulfate exceeded the laboratory's acceptance criteria, but were within the ±25 percent requirement.)

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference (RPD) for non-radiochemical replicate results that are greater than 5 times the PQL should be less than 20 percent (or less than the laboratory-derived control limits for organics). For results that are less than 5 times the PQL, the range should be no greater than the PQL. For radiochemical measurements, the relative error ratio (the ratio of the absolute difference between the sample and duplicate results and the sum of the 1-sigma uncertainties) is used to evaluate duplicate results and should be less than 3. All replicate results met these criteria, demonstrating acceptable precision. (A replicate analysis for molybdenum exceeded the laboratory's acceptance criteria, but because the range was less than the PQL, no data qualification is necessary.)

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution data were acceptable, with one exception. A serial dilution for potassium did not meet the acceptance criteria. Because of the possible reduced accuracy due to matrix interference, the associated result is qualified with a "J" flag as an estimated value.

PCB Surrogate Recoveries

Laboratory performance for individual samples is established by monitoring the recovery of surrogate spikes. The PCB surrogate recoveries were within the acceptance ranges for all samples.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all PCB and ion chromatography data. All peak integrations, including manual integrations, were satisfactory.

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with (be equal to) the total cations when expressed in milliequivalents per liter. Table 5 shows the total anion and cation results in groundwater samples from this event and the charge balance, which is an RPD calculation. Typically, a charge balance difference of 10 percent is considered acceptable.

Table 5. Comparison of Major Anions and Cations in Groundwater Samples

Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
11(SG)	28.0	32.3	7.1
13(SG)	15.5	16.7	3.5
14(SG)	19.8	23.0	7.6
15(SG)	18.1	21.0	7.5
16(SG)	41.5	47.9	7.1
18(SG)	16.9	19.6	7.4
20(M)	13.3	15.2	6.5
21(M)	17.3	20.9	9.5
22(M)	12.3	14.3	7.3
23(M)	10.2	11.9	7.7
E(M)	13.8	16.8	9.7
F(M)	5.2	5.8	5.1
HMC-951	12.7	9.7	NA
I(SG) LMS 319 (300)	29.1	34.6	8.7
I(SG) LMS 337 (265)	30.2	36.8	9.8
I(SG) LMS 338 (240)	21.6	35.3	24.1
I(SG) LMS 339 (210)	30.0	34.9	7.6
L(SG)	26.1	30.0	7.0
OBS-3	34.1	39.1	6.9
S(SG)	44.5	47.3	3.1
X(M)	20.2	20.6	1.1
Y2(M)	6.6	6.8	1.5

The charge balance value for most locations was less than 10 percent, with the following exceptions. At location HMC-951, the alkalinity value is not available. The charge balance is

therefore not applicable. At location I(SG) (ticket number LMS 338, depth = 240 feet) the charge balance was above 10 percent. Further review of the data for this location did not indicate any errors in the laboratory data. The alkalinity value was approximately twice the values measured at the other I(SG) sampling points.

Electronic Data Deliverable (EDD) File

The EDD file arrived on December, 20, 2013. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package. An incorrect sample date for location X(M) was provided to the laboratory on the Chain of Custody. The sample date was corrected upon entry into the environmental database.

SAMPLE MANAGEMENT SYSTEM
General Data Validation Report

RIN: 13115746 **Lab Code:** GEN **Validator:** Gretchen Baer **Validation Date:** 1/27/2014

Project: Bluewater **Analysis Type:** ☑ Metals ☑ General Chem ☑ Rad ☑ Organics

# of Samples: 24 **Matrix:** Water **Requested Analysis Completed:** Yes

Chain of Custody

Present: OK **Signed:** OK **Dated:** OK

Sample

Integrity: OK **Preservation:** OK **Temperature:** OK

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	There are 0 detection limit failures.
☐ Field/Trip Blanks	
☑ Field Duplicates	There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM
Organics Data Validation Summary

RIN: 13115746 **Project:** Bluewater **Lab Code:** GEN **Validation Date:** 1/28/2014

LCS Recovery: All LCS recoveries were within the laboratory acceptance limits.

Method Blank(s): All method blanks results were below the method detection limit.

MS/MSD Recovery: All MS/MSD recoveries were within the laboratory acceptance limits.

Surrogate Recovery: All surrogate recoveries were within the laboratory acceptance limits.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 13115746 **Lab Code:** GEN **Date Due:** 12/20/2013

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/30/2013

Analyte	Method Type	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV	CCB								
Calcium	ICP/ES	12/12/2013	0.0000	1.0000	OK	OK	OK	94.3			3.0	93.0	4.0	99.0
Calcium	ICP/ES	12/04/2013	0.0000	1.0000	OK	OK	OK	102.0			2.0	92.0	0.1	108.0
Magnesium	ICP/ES	12/12/2013	0.0000	1.0000	OK	OK	OK	94.5			3.0	94.0	4.0	94.0
Magnesium	ICP/ES	12/04/2013	0.0000	1.0000	OK	OK	OK	106.0	85.5		1.0	92.0	0.6	109.0
Potassium	ICP/ES	12/12/2013	0.0000	1.0000	OK	OK	OK	98.9	93.9		3.0	104.0	11.3	69.7
Potassium	ICP/ES	12/04/2013	0.0000	1.0000	OK	OK	OK	103.0	91.5		2.0	102.0	0.8	48.0
Sodium	ICP/ES	12/04/2013	0.0000	1.0000	OK	OK	OK	98.8			1.0	97.0	2.0	142.0
Sodium	ICP/ES	12/12/2013	0.0000	1.0000	OK	OK	OK	93.5			6.0	98.0	0.2	87.3
Arsenic	ICP/MS	12/18/2013	0.0000	1.0000	OK	OK						97.0		78.0
Arsenic	ICP/MS	12/17/2013	0.0000	1.0000	OK	OK	OK	94.7	101.0		19.0	96.0	3.0	86.0
Arsenic	ICP/MS	12/13/2013	0.0000	1.0000	OK	OK	OK	98.9	98.5			105.0		86.0
Molybdenum	ICP/MS	12/17/2013	0.0000	1.0000	OK	OK	OK	108.0	115.0		13.0	104.0		102.0
Molybdenum	ICP/MS	12/19/2013	0.0000	1.0000	OK	OK	OK	115.0	122.0			108.0		99.0
Selenium	ICP/MS	12/13/2013	0.0000	1.0000	OK	OK	OK	104.0	105.0		1.0	104.0		105.0
Selenium	ICP/MS	12/17/2013	0.0000	1.0000	OK	OK	OK	98.2	105.0			96.0		95.0
Selenium	ICP/MS	12/19/2013	0.0000	1.0000	OK	OK						101.0		99.0
Uranium	ICP/MS	12/17/2013	0.0000	1.0000	OK	OK						91.0		94.0

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 13115746 **Lab Code:** GEN **Date Due:** 12/20/2013

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/30/2013

Analyte	Method Type	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV	CCB								
Uranium	ICP/MS	12/16/2013	0.0000	1.0000	OK	OK	OK	114.0	105.0		3.0	97.0	6.0	104.0
Uranium	ICP/MS	12/16/2013	0.0000	1.0000	OK	OK	OK	107.0	80.2		1.0	98.0	7.0	96.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 13115746 **Lab Code:** GEN **Date Due:** 12/20/2013

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/30/2013

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
Chloride	08/19/2013	0.048	0.9995								
Chloride	12/03/2013			OK	OK	OK	96.80				
Chloride	12/04/2013							106.0		1.00	
Chloride	12/04/2013							96.0		7.00	
Chloride	12/10/2013			OK	OK	OK	96.40				
Chloride	12/11/2013							96.6		2.00	
Chloride	12/12/2013			OK	OK	OK	99.00	98.7		0	
Chloride	12/12/2013							120.0		0	
Chloride	12/12/2013							117.0		0	
NO2+NO3 as N	12/09/2013	-0.014	0.9990			OK	98.90	96.8		12.00	
NO2+NO3 as N	12/09/2013							109.0			
NO2+NO3 as N	12/17/2013	-0.011	0.9991			OK	101.00	99.8		1.00	
NO2+NO3 as N	12/17/2013							93.1		0	
Sulfate	08/19/2013	0.042	0.9998								
Sulfate	12/03/2013			OK	OK	OK	102.00				

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 13115746 **Lab Code:** GEN **Date Due:** 12/20/2013

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/30/2013

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
Sulfate	12/04/2013							116.0		1.00	
Sulfate	12/04/2013							104.0		0	
Sulfate	12/10/2013			OK	OK	OK	104.00				
Sulfate	12/11/2013							104.0		6.00	
Sulfate	12/12/2013			OK	OK	OK	102.00	111.0		0	
Sulfate	12/16/2013							102.0		5.00	
Sulfate	12/17/2013							96.9		16.00	
Total Dissolved Solids	11/25/2013					OK	102.00			2.00	
Total Dissolved Solids	11/25/2013					OK	98.10			0	
Total Dissolved Solids	11/25/2013									2.00	
Total Dissolved Solids	11/25/2013									3.00	
Total Dissolved Solids	11/25/2013									0	
Total Dissolved Solids	11/26/2013					OK	95.70				

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 13115746 **Lab Code:** GEN **Date Due:** 12/20/2013

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/30/2013

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
E(M)	Uranium-233+234	12/11/2013			87.0			
F(M)	Uranium-233+234	12/11/2013			85.0			
HMC-951	Uranium-233+234	12/11/2013			95.0			
I(SG)	Uranium-233+234	12/11/2013			92.0			
I(SG)	Uranium-233+234	12/11/2013			89.0			
I(SG)	Uranium-233+234	12/11/2013			90.0			
I(SG)	Uranium-233+234	12/11/2013			80.0			
L(SG)	Uranium-233+234	12/11/2013			92.0			
OBS-3	Uranium-233+234	12/11/2013			77.0			
S(SG)	Uranium-233+234	12/11/2013			55.0			
X(M)	Uranium-233+234	12/11/2013			88.0			
Y2(M)	Uranium-233+234	12/11/2013			85.0			
Blank	Uranium-233+234	12/11/2013	0.0190	U	86.0			
Blank_Spike_Du	Uranium-233+234	12/11/2013						0.10
11(SG)	Uranium-233+234	12/12/2013			85.0			
13(SG)	Uranium-233+234	12/12/2013			80.0			
14(SG)	Uranium-233+234	12/12/2013			89.0			
15(SG)	Uranium-233+234	12/12/2013			81.0			
16(SG)	Uranium-233+234	12/12/2013			33.0			
20(M)	Uranium-233+234	12/12/2013			98.0			
2074	Uranium-233+234	12/12/2013			57.0			
21(M)	Uranium-233+234	12/12/2013			86.0			
22(M)	Uranium-233+234	12/12/2013			65.0			
23(M)	Uranium-233+234	12/12/2013			95.0			
2554	Uranium-233+234	12/12/2013			85.0			
Blank_Spike	Uranium-233+234	12/12/2013			100.0			
Blank_Spike_Du	Uranium-233+234	12/12/2013			88.0			
Blank	Uranium-233+234	12/12/2013	-0.0144	U	91.0			
Blank_Spike_Du	Uranium-233+234	12/12/2013						0.10
18(SG)	Uranium-233+234	12/13/2013			90.0			
Blank_Spike_Du	Uranium-235	12/11/2013						0.70
Blank	Uranium-235	12/11/2013	-0.0235	U				

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 13115746 **Lab Code:** GEN **Date Due:** 12/20/2013

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/30/2013

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
Blank_Spike_Du	Uranium-235	12/12/2013						0
Blank	Uranium-235	12/12/2013	0	U				
Blank_Spike	Uranium-238	12/11/2013				99.90		
Blank_Spike_Du	Uranium-238	12/11/2013				95.60		1.10
Blank	Uranium-238	12/11/2013	0.0381	U				
Blank_Spike	Uranium-238	12/12/2013				92.60		
Blank_Spike_Du	Uranium-238	12/12/2013				103.00		0.30
Blank	Uranium-238	12/12/2013	0	U				

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

Sample results for monitoring wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method and Category I criteria, with the following exceptions:

- Wells I(SG) [ticket number LMS 339, pump intake at 210 feet], HMC-951, OBS-3, and S(SG) were not sampled using low-flow criteria. These wells were sampled using high-volume and high-flow submersible pumps with no field parameter stability requirements.
- Wells 23(M) and E(M) were classified as Category II or III. The sample results were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

No equipment blanks were taken. All samples were collected using dedicated equipment that did not require equipment blanks.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. Duplicate samples were collected from locations 15(SG) and 21(M). The RPD for duplicate results that are greater than 5 times the PQL should be less than 20 percent. The RPD is not used to evaluate results that are less than 5 times the PQL. For these results (RPD is "NA" on the Field Duplicates report), the range should be no greater than the PQL. The duplicate results met the criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 13115746 **Lab Code:** GEN **Project:** Bluewater **Validation Date:** 1/27/2014

Duplicate: 2074 **Sample:** 15(SG)

Analyte	Sample Result	Flag	Error	Dilution	Duplicate Result	Flag	Error	Dilution	RPD	RER	Units
Arsenic	2.59	B		1.00	1.70	U		1.00			ug/L
Calcium	100000			1.00	102000			1.00	1.98		ug/L
Chloride	185			20.00	187			20.00	1.08		mg/L
Magnesium	34800			1.00	35300			1.00	1.43		ug/L
Molybdenum	9.95	*		1.00	10.1	*		1.00	1.50		ug/L
NO2+NO3 as N	3.78			10.00	3.81			10.00	0.79		mg/L
Potassium	5910	E		1.00	6020	E		1.00	1.84		ug/L
Selenium	2.27	B		1.00	2.22	B		1.00			ug/L
Sodium	232000			1.00	234000			1.00	0.86		ug/L
Sulfate	436			50.00	432			50.00	0.92		mg/L
Total Dissolved Solids	1300			1.00	1280			1.00	1.55		mg/L
Uranium	174			10.00	178			10.00	2.27		ug/L
Uranium-233+234	60.2		7.93	1.00	53.9		7.63	1.00	11.04	1.1	pCi/L
Uranium-235/236	2.71		0.626	1.00	2.97		0.797	1.00	9.15	0.5	pCi/L
Uranium-238	55.8		7.36	1.00	52.7		7.46	1.00	5.71	0.6	pCi/L

Duplicate: 2554 **Sample:** 21(M)

Analyte	Sample Result	Flag	Error	Dilution	Duplicate Result	Flag	Error	Dilution	RPD	RER	Units
Arsenic	1.70	U		1.00	1.70	U		1.00			ug/L
Calcium	132000			1.00	134000			1.00	1.50		ug/L
Chloride	150			20.00	153			20.00	1.98		mg/L
Magnesium	34400			1.00	35000			1.00	1.73		ug/L
Molybdenum	1.45	*		1.00	1.09	*		1.00	NA		ug/L
NO2+NO3 as N	12.0			50.00	11.9			10.00	0.84		mg/L
Potassium	5130	E		1.00	5240	E		1.00	2.12		ug/L
Selenium	10.1			1.00	10.5			1.00	3.88		ug/L
Sodium	178000			1.00	180000			1.00	1.12		ug/L
Sulfate	509			50.00	514			50.00	0.98		mg/L
Total Dissolved Solids	1330			1.00	1380			1.00	3.69		mg/L
Uranium	137			10.00	139			10.00	1.45		ug/L
Uranium-233+234	46.1		6.15	1.00	46.3		6.18	1.00	0.43	0	pCi/L
Uranium-235/236	1.90		0.506	1.00	2.09		0.535	1.00	9.52	0.5	pCi/L
Uranium-238	40.4		5.43	1.00	43.1		5.77	1.00	6.47	0.7	pCi/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Stephen Donivan — Stephen Donivan — Date: 2-10-2014

Data Validation Lead: Stph Doni Eq GRB — Gretchen Baer — Date: 2-10-2014

Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition. The review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

Molybdenum and nitrate + nitrite as N results in well 21(M), and arsenic, calcium, magnesium, and selenium results in well F(M) were identified as potentially anomalous. The data associated with these results were further reviewed. There were no errors noted and the data for this RIN are acceptable as qualified. Potential anomalies in the field parameters were also examined for patterns of repeated high or low bias, which suggest a systematic error due to instrument malfunction. No such patterns were found and all the results from this sampling event are acceptable as qualified.

There were no anomalies identified in the previous report (May 2013) that required further review.

Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 1/1/2003
Laboratory: GEL Laboratories
RIN: 13115746
Report Date: 1/29/2014

					Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
BLU01	21(M)	N002	11/19/2013	Calcium	134		F	170		F	146		F	7	0	No
BLU01	21(M)	N001	11/19/2013	Calcium	132		F	170		F	146		F	7	0	No
BLU01	21(M)	N002	11/19/2013	Magnesium	35		F	44.7		F	39.4		F	7	0	No
BLU01	21(M)	N001	11/19/2013	Magnesium	34.4		F	44.7		F	39.4		F	7	0	No
BLU01	21(M)	N001	11/19/2013	Molybdenum	0.00145	*	F	0.0011		F	0.000865		F	7	0	Yes
BLU01	21(M)	N002	11/19/2013	Nitrate + Nitrite as Nitrogen	11.9		F	9.81		F	7.9		F	7	0	Yes
BLU01	21(M)	N001	11/19/2013	Nitrate + Nitrite as Nitrogen	12		F	9.81		F	7.9		F	7	0	Yes
BLU01	21(M)	N001	11/19/2013	Potassium	5.13	E	F	7.9		F	5.52		F	7	0	No
BLU01	21(M)	N002	11/19/2013	Potassium	5.24	E	F	7.9		F	5.52		F	7	0	No
BLU01	21(M)	N001	11/19/2013	Sodium	178		F	217		F	180		F	7	0	No
BLU01	22(M)	N001	11/19/2013	Calcium	78.4		F	102		F	86.2		F	6	0	No
BLU01	22(M)	N001	11/19/2013	Magnesium	21.2		F	29		F	24.4		F	6	0	No
BLU01	22(M)	N001	11/19/2013	Potassium	4.32	E	F	6.7		F	4.69	E	JF	6	0	No
BLU01	22(M)	N001	11/19/2013	Selenium	0.00372	B	F	0.0076		F	0.00469	B	F	6	0	No
BLU01	22(M)	N001	11/19/2013	Uranium	0.388		F	0.38		F	0.31		F	6	0	No
BLU01	E(M)	0001	11/19/2013	Calcium	164		FQ	262		FQ	195		FQ	8	0	No
BLU01	E(M)	0001	11/19/2013	Magnesium	42.1		FQ	63.1		FQ	50.2		FQ	8	0	No
BLU01	E(M)	0001	11/19/2013	Potassium	3.88	E	FQ	5.56	E	FQ	3.99	E	JFQ	8	0	No
BLU01	E(M)	0001	11/19/2013	Sodium	47.4		FQ	63.6		FQ	50.9		FQ	8	0	No
BLU01	E(M)	0001	11/19/2013	Sulfate	747		FQ	960		FQ	750		FQ	8	0	No
BLU01	E(M)	0001	11/19/2013	Total Dissolved Solids	1130		FQ	1550		FQ	1170		FQ	8	0	No

Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 1/1/2003
Laboratory: GEL Laboratories
RIN: 13115746
Report Date: 1/29/2014

					Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
BLU01	F(M)	N001	11/19/2013	Arsenic	0.0085	U	F	0.00171	B	F	0.0011		F	10	5	Yes
BLU01	F(M)	N001	11/19/2013	Calcium	60.7		F	78		F	70.2		F	10	0	Yes
BLU01	F(M)	N001	11/19/2013	Magnesium	16.1		F	20.6		F	18.5		F	10	0	Yes
BLU01	F(M)	N001	11/19/2013	Selenium	0.0075	U	F	0.00176	B	F	0.00043		F	16	3	Yes
BLU01	F(M)	N001	11/19/2013	Total Dissolved Solids	451		F	420		F	349		F	10	0	No
BLU01	I(SG)	N002	11/19/2013	Arsenic	0.0085	U	F	0.00224	B	F	0.00011		F	9	6	NA
BLU01	I(SG)	N004	11/19/2013	Arsenic	0.0085	U		0.00224	B	F	0.00011		F	9	6	NA
BLU01	I(SG)	0001	11/19/2013	Arsenic	0.0085	U	F	0.00224	B	F	0.00011		F	9	6	NA
BLU01	I(SG)	N003	11/19/2013	Arsenic	0.0085	U	F	0.00224	B	F	0.00011		F	9	6	NA
BLU01	I(SG)	N002	11/19/2013	Chloride	288		F	272		F	176		F	9	0	No
BLU01	I(SG)	N003	11/19/2013	Chloride	306		F	272		F	176		F	9	0	No
BLU01	I(SG)	N004	11/19/2013	Chloride	293			272		F	176		F	9	0	No
BLU01	I(SG)	N003	11/19/2013	Molybdenum	0.00142	*	F	0.0013		UF	0.000532		F	9	1	No
BLU01	I(SG)	N004	11/19/2013	Molybdenum	0.00166	*		0.0013		UF	0.000532		F	9	1	No
BLU01	I(SG)	N002	11/19/2013	Molybdenum	0.00153	*	F	0.0013		UF	0.000532		F	9	1	No
BLU01	I(SG)	N004	11/19/2013	Nitrate + Nitrite as Nitrogen	1.46			1.45		F	0.01	U	F	10	8	NA
BLU01	I(SG)	N003	11/19/2013	Nitrate + Nitrite as Nitrogen	1.53		F	1.45		F	0.01	U	F	10	8	NA
BLU01	I(SG)	N003	11/19/2013	Sulfate	948		F	849		F	79		F	9	0	No
BLU01	I(SG)	N002	11/19/2013	Sulfate	902		F	849		F	79		F	9	0	No
BLU01	I(SG)	N004	11/19/2013	Sulfate	887			849		F	79		F	9	0	No

Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 1/1/2003
Laboratory: GEL Laboratories
RIN: 13115746
Report Date: 1/29/2014

					Current			**Historical Maximum**			**Historical Minimum**			**Number of Data Points**		**Statistical Outlier**
						Qualifiers			*Qualifiers*			*Qualifiers*				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
BLU01	I(SG)	N004	11/19/2013	Total Dissolved Solids	2230			2220		F	530		F	9	0	NA
BLU01	L(SG)	N001	11/19/2013	Arsenic	0.0085	U	F	0.00224	B	F	0.000045	B	F	10	7	NA
BLU01	L(SG)	N001	11/19/2013	Sulfate	630		F	613		F	1.7		F	10	0	NA
BLU01	OBS-3	0001	11/20/2013	Potassium	11.9	E		22			12.4	E	J	9	0	No
BLU01	S(SG)	0001	11/20/2013	Calcium	283			897		F	287			9	0	NA
BLU01	S(SG)	0001	11/20/2013	Molybdenum	0.00226	*		0.00148			0.000167	U	F	9	2	No
BLU01	S(SG)	0001	11/20/2013	Total Dissolved Solids	2950			5250		F	3010			9	0	NA
BLU01	Y2(M)	N001	11/19/2013	Calcium	56.5		F	77		F	57.9		F	11	0	NA
BLU01	Y2(M)	N001	11/19/2013	Chloride	17.3		F	17		F	7		F	11	0	No
BLU01	Y2(M)	N001	11/19/2013	Nitrate + Nitrite as Nitrogen	1.66		F	1.54		F	0.494		F	13	0	NA

STATISTICAL TESTS:
The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test
Outliers are identified using Dixon's Test when there are 25 or fewer data points.
Outliers are identified using Rosner's Test when there are 26 or more data points.
See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

NA: Data are not normally or lognormally distributed.

Attachment 2
Data Presentation

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Groundwater Quality Data

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General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: 11(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	265	-	295	568		F	#		
Arsenic	mg/L	11/19/2013	N001	265	-	295	0.0103		F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	265	-	295	172		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	265	-	295	192		F	#	3.35	
Dissolved Oxygen	mg/L	11/19/2013	N001	265	-	295	1.13		F	#		
Magnesium	mg/L	11/19/2013	N001	265	-	295	60.8		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	265	-	295	0.00188	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	265	-	295	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/19/2013	N001	265	-	295	-148.3		F	#		
pH	s.u.	11/19/2013	N001	265	-	295	6.93		F	#		
Potassium	mg/L	11/19/2013	N001	265	-	295	10	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	265	-	295	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	265	-	295	326		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	265	-	295	2634		F	#		
Sulfate	mg/L	11/19/2013	N001	265	-	295	744		F	#	6.65	
Temperature	C	11/19/2013	N001	265	-	295	13.78		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	265	-	295	1930		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	265	-	295	0.36		F	#		
Uranium	mg/L	11/19/2013	N001	265	-	295	0.0117		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	265	-	295	5.73		F	#	0.192	0.985
Uranium-235/236	pCi/L	11/19/2013	N001	265	-	295	0.19	U	F	#	0.19	0.162
Uranium-238	pCi/L	11/19/2013	N001	265	-	295	3.61		F	#	0.0601	0.698

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 13(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	270 - 300	267		F	#		
Arsenic	mg/L	11/19/2013	N001	270 - 300	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	270 - 300	151		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	270 - 300	87.7		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	270 - 300	3.08		F	#		
Magnesium	mg/L	11/19/2013	N001	270 - 300	43.9		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	270 - 300	0.00198	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	270 - 300	5.18		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	270 - 300	-50.7		F	#		
pH	s.u.	11/19/2013	N001	270 - 300	7.04		F	#		
Potassium	mg/L	11/19/2013	N001	270 - 300	5.82	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	270 - 300	0.00496	B	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	270 - 300	97.7		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	270 - 300	1529		F	#		
Sulfate	mg/L	11/19/2013	N001	270 - 300	407		F	#	6.65	
Temperature	C	11/19/2013	N001	270 - 300	13.85		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	270 - 300	1060		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	270 - 300	0.78		F	#		
Uranium	mg/L	11/19/2013	N001	270 - 300	0.0985		F	#	0.000335	
Uranium-234	pCi/L	11/19/2013	N001	270 - 300	37.8		F	#	0.238	5.11
Uranium-235/236	pCi/L	11/19/2013	N001	270 - 300	1.86		F	#	0.0797	0.501
Uranium-238	pCi/L	11/19/2013	N001	270 - 300	35.4		F	#	0.164	4.81

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: 14(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	285	-	315	451		F	#		
Arsenic	mg/L	11/19/2013	N001	285	-	315	0.00625		F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	285	-	315	122		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	285	-	315	153		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	285	-	315	0.85		F	#		
Magnesium	mg/L	11/19/2013	N001	285	-	315	47.3		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	285	-	315	0.0033	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	285	-	315	0.0238	J	F	#	0.017	
Oxidation Reduction Potential	mV	11/19/2013	N001	285	-	315	-18.3		F	#		
pH	s.u.	11/19/2013	N001	285	-	315	7.07		F	#		
Potassium	mg/L	11/19/2013	N001	285	-	315	4.82	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	285	-	315	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	285	-	315	222		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	285	-	315	1947		F	#		
Sulfate	mg/L	11/19/2013	N001	285	-	315	465		F	#	6.65	
Temperature	C	11/19/2013	N001	285	-	315	14.21		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	285	-	315	1380		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	285	-	315	1.03		F	#		
Uranium	mg/L	11/19/2013	N001	285	-	315	0.0741		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	285	-	315	26.9		F	#	0.0589	3.67
Uranium-235/236	pCi/L	11/19/2013	N001	285	-	315	0.971		F	#	0.0728	0.331
Uranium-238	pCi/L	11/19/2013	N001	285	-	315	23.8		F	#	0.15	3.28

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 15(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	341 - 371	322		F	#		
Arsenic	mg/L	11/19/2013	N001	341 - 371	0.00259	B	F	#	0.0017	
Arsenic	mg/L	11/19/2013	N002	341 - 371	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	341 - 371	100		F	#	0.05	
Calcium	mg/L	11/19/2013	N002	341 - 371	102		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	341 - 371	185		F	#	1.34	
Chloride	mg/L	11/19/2013	N002	341 - 371	187		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	341 - 371	0.96		F	#		
Magnesium	mg/L	11/19/2013	N001	341 - 371	34.8		F	#	0.11	
Magnesium	mg/L	11/19/2013	N002	341 - 371	35.3		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	341 - 371	0.00995	*	F	#	0.000165	
Molybdenum	mg/L	11/19/2013	N002	341 - 371	0.0101	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	341 - 371	3.78		F	#	0.17	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N002	341 - 371	3.81		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	341 - 371	4.3		F	#		
pH	s.u.	11/19/2013	N001	341 - 371	7.29		F	#		
Potassium	mg/L	11/19/2013	N001	341 - 371	5.91	E	F	#	0.05	
Potassium	mg/L	11/19/2013	N002	341 - 371	6.02	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	341 - 371	0.00227	B	F	#	0.0015	
Selenium	mg/L	11/19/2013	N002	341 - 371	0.00222	B	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	341 - 371	232		F	#	0.1	
Sodium	mg/L	11/19/2013	N002	341 - 371	234		F	#	0.1	

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 15(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Specific Conductance	umhos /cm	11/19/2013	N001	341	-	371	1954		F	#		
Sulfate	mg/L	11/19/2013	N001	341	-	371	436		F	#	6.65	
Sulfate	mg/L	11/19/2013	N002	341	-	371	432		F	#	6.65	
Temperature	C	11/19/2013	N001	341	-	371	14.5		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	341	-	371	1300		F	#	3.4	
Total Dissolved Solids	mg/L	11/19/2013	N002	341	-	371	1280		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	341	-	371	0.99		F	#		
Uranium	mg/L	11/19/2013	N001	341	-	371	0.174		F	#	0.00067	
Uranium	mg/L	11/19/2013	N002	341	-	371	0.178		F	#	0.00067	
Uranium-234	pCi/L	11/19/2013	N001	341	-	371	60.2		F	#	0.16	7.93
Uranium-234	pCi/L	11/19/2013	N002	341	-	371	53.9		F	#	0.379	7.63
Uranium-235/236	pCi/L	11/19/2013	N001	341	-	371	2.71		F	#	0.0776	0.626
Uranium-235/236	pCi/L	11/19/2013	N002	341	-	371	2.97		F	#	0.421	0.797
Uranium-238	pCi/L	11/19/2013	N001	341	-	371	55.8		F	#	0.231	7.36
Uranium-238	pCi/L	11/19/2013	N002	341	-	371	52.7		F	#	0.236	7.46

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 16(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	195 - 225	378		F	#		
Arsenic	mg/L	11/19/2013	N001	195 - 225	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	195 - 225	286		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	195 - 225	479		F	#	6.7	
Dissolved Oxygen	mg/L	11/19/2013	N001	195 - 225	1.73		F	#		
Magnesium	mg/L	11/19/2013	N001	195 - 225	138		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	195 - 225	0.00288	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	195 - 225	4.83		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	195 - 225	86.9		F	#		
pH	s.u.	11/19/2013	N001	195 - 225	6.77		F	#		
Potassium	mg/L	11/19/2013	N001	195 - 225	11.4	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	195 - 225	0.0147		F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	195 - 225	358		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	195 - 225	3970		F	#		
Sulfate	mg/L	11/19/2013	N001	195 - 225	1270		F	#	13.3	
Temperature	C	11/19/2013	N001	195 - 225	13.84		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	195 - 225	3040		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	195 - 225	9.81		F	#		
Uranium	mg/L	11/19/2013	N001	195 - 225	1.4		F	#	0.0067	
Uranium-234	pCi/L	11/19/2013	N001	195 - 225	381		F	#	0.57	56.8
Uranium-235/236	pCi/L	11/19/2013	N001	195 - 225	19.6		F	#	0.191	3.62
Uranium-238	pCi/L	11/19/2013	N001	195 - 225	401		F	#	0.691	59.7

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: 18(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	260	-	290	346		F	#		
Arsenic	mg/L	11/19/2013	N001	260	-	290	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	260	-	290	143		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	260	-	290	101		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	260	-	290	0.81		F	#		
Magnesium	mg/L	11/19/2013	N001	260	-	290	40.6		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	260	-	290	0.00393	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	260	-	290	1.07		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	260	-	290	-4.9		F	#		
pH	s.u.	11/19/2013	N001	260	-	290	6.97		F	#		
Potassium	mg/L	11/19/2013	N001	260	-	290	6.54	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	260	-	290	0.00177	B	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	260	-	290	144		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	260	-	290	1665		F	#		
Sulfate	mg/L	11/19/2013	N001	260	-	290	469		F	#	6.65	
Temperature	C	11/19/2013	N001	260	-	290	14.31		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	260	-	290	1200		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	260	-	290	3.1		F	#		
Uranium	mg/L	11/19/2013	N001	260	-	290	0.127		F	#	0.00067	
Uranium-234	pCi/L	11/19/2013	N001	260	-	290	44.7		F	#	0.74	8.38
Uranium-235/236	pCi/L	11/19/2013	N001	260	-	290	1.45		JF	#	0.506	0.839
Uranium-238	pCi/L	11/19/2013	N001	260	-	290	44.1		F	#	0.562	8.27

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 20(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	110 - 125	250		F	#		
Arsenic	mg/L	11/19/2013	N001	110 - 125	0.0085	U	F	#	0.0085	
Calcium	mg/L	11/19/2013	N001	110 - 125	137		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	110 - 125	58.3		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	110 - 125	7.47		F	#		
Magnesium	mg/L	11/19/2013	N001	110 - 125	33.9		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	110 - 125	0.00254	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	110 - 125	4.37		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	110 - 125	-.2		F	#		
pH	s.u.	11/19/2013	N001	110 - 125	7.23		F	#		
Potassium	mg/L	11/19/2013	N001	110 - 125	4.17	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	110 - 125	0.00381	B	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	110 - 125	82.9		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	110 - 125	1297		F	#		
Sulfate	mg/L	11/19/2013	N001	110 - 125	395		F	#	6.65	
Temperature	C	11/19/2013	N001	110 - 125	13.5		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	110 - 125	963		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	110 - 125	0.53		F	#		
Uranium	mg/L	11/19/2013	N001	110 - 125	0.0139		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	110 - 125	6.58		F	#	0.197	1.06
Uranium-235/236	pCi/L	11/19/2013	N001	110 - 125	0.418		JF	#	0.211	0.222
Uranium-238	pCi/L	11/19/2013	N001	110 - 125	4.66		F	#	0.136	0.812

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 21(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	139.6	-	149.6	261		F	#		
Arsenic	mg/L	11/19/2013	N001	139.6	-	149.6	0.0017	U	F	#	0.0017	
Arsenic	mg/L	11/19/2013	N002	139.6	-	149.6	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	139.6	-	149.6	132		F	#	0.05	
Calcium	mg/L	11/19/2013	N002	139.6	-	149.6	134		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	139.6	-	149.6	150		F	#	1.34	
Chloride	mg/L	11/19/2013	N002	139.6	-	149.6	153		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	139.6	-	149.6	4.9		F	#		
Magnesium	mg/L	11/19/2013	N001	139.6	-	149.6	34.4		F	#	0.11	
Magnesium	mg/L	11/19/2013	N002	139.6	-	149.6	35		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	139.6	-	149.6	0.00145	*	F	#	0.000165	
Molybdenum	mg/L	11/19/2013	N002	139.6	-	149.6	0.00109	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	139.6	-	149.6	12		F	#	0.85	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N002	139.6	-	149.6	11.9		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	139.6	-	149.6	33.5		F	#		
pH	s.u.	11/19/2013	N001	139.6	-	149.6	7.32		F	#		
Potassium	mg/L	11/19/2013	N001	139.6	-	149.6	5.13	E	F	#	0.05	
Potassium	mg/L	11/19/2013	N002	139.6	-	149.6	5.24	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	139.6	-	149.6	0.0101		F	#	0.0015	
Selenium	mg/L	11/19/2013	N002	139.6	-	149.6	0.0105		F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	139.6	-	149.6	178		F	#	0.1	

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 21(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sodium	mg/L	11/19/2013	N002	139.6 - 149.6	180		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	139.6 - 149.6	1874		F	#		
Sulfate	mg/L	11/19/2013	N001	139.6 - 149.6	509		F	#	6.65	
Sulfate	mg/L	11/19/2013	N002	139.6 - 149.6	514		F	#	6.65	
Temperature	C	11/19/2013	N001	139.6 - 149.6	13.93		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	139.6 - 149.6	1330		F	#	3.4	
Total Dissolved Solids	mg/L	11/19/2013	N002	139.6 - 149.6	1380		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	139.6 - 149.6	0.49		F	#		
Uranium	mg/L	11/19/2013	N001	139.6 - 149.6	0.137		F	#	0.00067	
Uranium	mg/L	11/19/2013	N002	139.6 - 149.6	0.139		F	#	0.00067	
Uranium-234	pCi/L	11/19/2013	N001	139.6 - 149.6	46.1		F	#	0.199	6.15
Uranium-234	pCi/L	11/19/2013	N002	139.6 - 149.6	46.3		F	#	0.234	6.18
Uranium-235/236	pCi/L	11/19/2013	N001	139.6 - 149.6	1.9		F	#	0.197	0.506
Uranium-235/236	pCi/L	11/19/2013	N002	139.6 - 149.6	2.09		F	#	0.0785	0.535
Uranium-238	pCi/L	11/19/2013	N001	139.6 - 149.6	40.4		F	#	0.199	5.43
Uranium-238	pCi/L	11/19/2013	N002	139.6 - 149.6	43.1		F	#	0.203	5.77

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: 22(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	136.83 - 146.83	315		F	#		
Arsenic	mg/L	11/19/2013	N001	136.83 - 146.83	0.00346	B	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	136.83 - 146.83	78.4		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	136.83 - 146.83	32.8		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	136.83 - 146.83	2.67		F	#		
Magnesium	mg/L	11/19/2013	N001	136.83 - 146.83	21.2		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	136.83 - 146.83	0.000975	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	136.83 - 146.83	34		F	#	1.7	
Oxidation Reduction Potential	mV	11/19/2013	N001	136.83 - 146.83	31.2		F	#		
pH	s.u.	11/19/2013	N001	136.83 - 146.83	7.34		F	#		
Potassium	mg/L	11/19/2013	N001	136.83 - 146.83	4.32	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	136.83 - 146.83	0.00372	B	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	136.83 - 146.83	151		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	136.83 - 146.83	1323		F	#		
Sulfate	mg/L	11/19/2013	N001	136.83 - 146.83	222		F	#	2.66	
Temperature	C	11/19/2013	N001	136.83 - 146.83	13.78		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	136.83 - 146.83	907		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	136.83 - 146.83	1.18		F	#		
Uranium	mg/L	11/19/2013	N001	136.83 - 146.83	0.388		F	#	0.00067	
Uranium-234	pCi/L	11/19/2013	N001	136.83 - 146.83	122		F	#	0.264	16.4
Uranium-235/236	pCi/L	11/19/2013	N001	136.83 - 146.83	4.77		F	#	0.42	1.03
Uranium-238	pCi/L	11/19/2013	N001	136.83 - 146.83	118		F	#	0.305	15.9

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: 23(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	89	-	109	150		FQ	#		
Arsenic	mg/L	11/19/2013	N001	89	-	109	0.0017	U	FQ	#	0.0017	
Calcium	mg/L	11/19/2013	N001	89	-	109	118		FQ	#	0.05	
Chloride	mg/L	11/19/2013	N001	89	-	109	91.7		FQ	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	89	-	109	3.03		FQ	#		
Magnesium	mg/L	11/19/2013	N001	89	-	109	26.1		FQ	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	89	-	109	0.00747	*	FQ	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	89	-	109	2.35		FQ	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	89	-	109	250		FQ	#		
pH	s.u.	11/19/2013	N001	89	-	109	6.75		FQ	#		
Potassium	mg/L	11/19/2013	N001	89	-	109	5.23	E	FQ	#	0.05	
Selenium	mg/L	11/19/2013	N001	89	-	109	0.00275	B	FQ	#	0.0015	
Sodium	mg/L	11/19/2013	N001	89	-	109	46.5		FQ	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	89	-	109	970		FQ	#		
Sulfate	mg/L	11/19/2013	N001	89	-	109	295		FQ	#	2.66	
Temperature	C	11/19/2013	N001	89	-	109	12.4		FQ	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	89	-	109	740		FQ	#	3.4	
Turbidity	NTU	11/19/2013	N001	89	-	109	4.16		FQ	#		
Uranium	mg/L	11/19/2013	N001	89	-	109	0.0209		FQ	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	89	-	109	8.95		FQ	#	0.225	1.37
Uranium-235/236	pCi/L	11/19/2013	N001	89	-	109	0.587		JFQ	#	0.216	0.261
Uranium-238	pCi/L	11/19/2013	N001	89	-	109	6.24		FQ	#	0.175	1.03

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: E(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	0001	68.6	-	89.8	15		FQ	#		
Aroclor - 1016	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Aroclor - 1221	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Aroclor - 1232	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Aroclor - 1242	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Aroclor - 1248	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Aroclor - 1254	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Aroclor - 1260	ug/L	11/19/2013	N001	68.6	-	89.8	0.0362	U	FQ	#	0.0362	
Arsenic	mg/L	11/19/2013	0001	68.6	-	89.8	0.0017	U	FQ	#	0.0017	
Calcium	mg/L	11/19/2013	0001	68.6	-	89.8	164		FQ	#	0.05	
Chloride	mg/L	11/19/2013	0001	68.6	-	89.8	33		FQ	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	68.6	-	89.8	0.35		FQ	#		
Magnesium	mg/L	11/19/2013	0001	68.6	-	89.8	42.1		FQ	#	0.11	
Molybdenum	mg/L	11/19/2013	0001	68.6	-	89.8	0.000638	*	FQ	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	0001	68.6	-	89.8	0.017	U	FQ	#	0.017	
Oxidation Reduction Potential	mV	11/19/2013	N001	68.6	-	89.8	-284		FQ	#		
pH	s.u.	11/19/2013	N001	68.6	-	89.8	8.02		FQ	#		
Potassium	mg/L	11/19/2013	0001	68.6	-	89.8	3.88	E	FQ	#	0.05	
Selenium	mg/L	11/19/2013	0001	68.6	-	89.8	0.0015	U	FQ	#	0.0015	
Sodium	mg/L	11/19/2013	0001	68.6	-	89.8	47.4		FQ	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	68.6	-	89.8	1338		FQ	#		

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: E(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sulfate	mg/L	11/19/2013	0001	68.6	-	89.8	747		FQ	#	6.65	
Temperature	C	11/19/2013	N001	68.6	-	89.8	15.72		FQ	#		
Total Dissolved Solids	mg/L	11/19/2013	0001	68.6	-	89.8	1130		FQ	#	3.4	
Turbidity	NTU	11/19/2013	N001	68.6	-	89.8	27.3		FQ	#		
Uranium	mg/L	11/19/2013	0001	68.6	-	89.8	0.000067	U	FQ	#	0.000067	
Uranium-234	pCi/L	11/19/2013	0001	68.6	-	89.8	0.113	U	FQ	#	0.113	0.0708
Uranium-235/236	pCi/L	11/19/2013	0001	68.6	-	89.8	0.139	U	FQ	#	0.139	0.0876
Uranium-238	pCi/L	11/19/2013	0001	68.6	-	89.8	0.113	U	FQ	#	0.113	0.0578

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: F(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	94.2	-	114.87	162		F	#		
Aroclor - 1016	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Aroclor - 1221	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Aroclor - 1232	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Aroclor - 1242	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Aroclor - 1248	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Aroclor - 1254	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Aroclor - 1260	ug/L	11/19/2013	N001	94.2	-	114.87	0.037	U	F	#	0.037	
Arsenic	mg/L	11/19/2013	N001	94.2	-	114.87	0.0085	U	F	#	0.0085	
Calcium	mg/L	11/19/2013	N001	94.2	-	114.87	60.7		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	94.2	-	114.87	12.2		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	94.2	-	114.87	2.96		F	#		
Magnesium	mg/L	11/19/2013	N001	94.2	-	114.87	16.1		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	94.2	-	114.87	0.00139	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	94.2	-	114.87	0.66		F	#	0.017	
Oxidation Reduction Potential	mV	11/19/2013	N001	94.2	-	114.87	-18.3		F	#		
pH	s.u.	11/19/2013	N001	94.2	-	114.87	7.71		F	#		
Potassium	mg/L	11/19/2013	N001	94.2	-	114.87	3.01	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	94.2	-	114.87	0.0075	U	F	#	0.0075	
Sodium	mg/L	11/19/2013	N001	94.2	-	114.87	18.4		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	94.2	-	114.87	537		F	#		

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: F(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sulfate	mg/L	11/19/2013	N001	94.2	-	114.87	104		F	#	2.66	
Temperature	C	11/19/2013	N001	94.2	-	114.87	14.43		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	94.2	-	114.87	451		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	94.2	-	114.87	1.9		F	#		
Uranium	mg/L	11/19/2013	N001	94.2	-	114.87	0.00734		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	94.2	-	114.87	3.2		F	#	0.244	0.605
Uranium-235/236	pCi/L	11/19/2013	N001	94.2	-	114.87	0.189	U	F	#	0.189	0.109
Uranium-238	pCi/L	11/19/2013	N001	94.2	-	114.87	2.53		F	#	0.0478	0.504

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: HMC-951 WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Arsenic	mg/L	11/20/2013	N001	-	0.0085	U		#	0.0085	
Calcium	mg/L	11/20/2013	N001	-	129			#	0.05	
Chloride	mg/L	11/20/2013	N001	-	59.4			#	1.34	
Dissolved Oxygen	mg/L	11/20/2013	N001	-	3.75			#		
Magnesium	mg/L	11/20/2013	N001	-	37			#	0.11	
Molybdenum	mg/L	11/20/2013	N001	-	0.00142	*		#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	N001	-	5.04			#	0.17	
Oxidation Reduction Potential	mV	11/20/2013	N001	-	-25			#		
pH	s.u.	11/20/2013	N001	-	7			#		
Potassium	mg/L	11/20/2013	N001	-	4.67	E		#	0.05	
Selenium	mg/L	11/20/2013	N001	-	0.0075	U		#	0.0075	
Sodium	mg/L	11/20/2013	N001	-	70.3			#	0.1	
Specific Conductance	umhos /cm	11/20/2013	N001	-	1215			#		
Sulfate	mg/L	11/20/2013	N001	-	369			#	2.66	
Temperature	C	11/20/2013	N001	-	12.9			#		
Total Dissolved Solids	mg/L	11/20/2013	N001	-	914		J	#	3.4	
Turbidity	NTU	11/20/2013	N001	-	7.11			#		
Uranium	mg/L	11/20/2013	N001	-	0.0313			#	0.000067	
Uranium-234	pCi/L	11/20/2013	N001	-	12			#	0.138	1.67
Uranium-235/236	pCi/L	11/20/2013	N001	-	0.518			#	0.137	0.211
Uranium-238	pCi/L	11/20/2013	N001	-	11			#	0.111	1.55

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: I(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	0001	-	804		F	#		
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N002	-	380		F	#		
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N003	-	414		F	#		
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N004	-	404			#		
Arsenic	mg/L	11/19/2013	0001	-	0.0085	U	F	#	0.0085	
Arsenic	mg/L	11/19/2013	N002	-	0.0085	U	F	#	0.0085	
Arsenic	mg/L	11/19/2013	N003	-	0.0085	U	F	#	0.0085	
Arsenic	mg/L	11/19/2013	N004	-	0.0085	U		#	0.0085	
Calcium	mg/L	11/19/2013	0001	-	138		F	#	0.05	
Calcium	mg/L	11/19/2013	N002	-	224		F	#	0.05	
Calcium	mg/L	11/19/2013	N003	-	231		F	#	0.05	
Calcium	mg/L	11/19/2013	N004	-	228			#	0.05	
Chloride	mg/L	11/19/2013	0001	-	238		F	#	3.35	
Chloride	mg/L	11/19/2013	N002	-	288		F	#	6.7	
Chloride	mg/L	11/19/2013	N003	-	306		F	#	6.7	
Chloride	mg/L	11/19/2013	N004	-	293			#	6.7	
Dissolved Oxygen	mg/L	11/19/2013	N001	-	1.18		F	#		
Dissolved Oxygen	mg/L	11/19/2013	N002	-	1.46		F	#		
Dissolved Oxygen	mg/L	11/19/2013	N003	-	1.35		F	#		
Dissolved Oxygen	mg/L	11/19/2013	N004	-	1.06			#		
Magnesium	mg/L	11/19/2013	0001	-	56.1		F	#	0.11	
Magnesium	mg/L	11/19/2013	N002	-	82.6		F	#	0.11	
Magnesium	mg/L	11/19/2013	N003	-	84.7		F	#	0.11	
Magnesium	mg/L	11/19/2013	N004	-	84.1			#	0.11	

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: I(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	11/19/2013	0001	-	0.000898	*	F	#	0.000165	
Molybdenum	mg/L	11/19/2013	N002	-	0.00153	*	F	#	0.000165	
Molybdenum	mg/L	11/19/2013	N003	-	0.00142	*	F	#	0.000165	
Molybdenum	mg/L	11/19/2013	N004	-	0.00166	*		#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	0001	-	0.432		F	#	0.017	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N002	-	1.45		F	#	0.017	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N003	-	1.53		F	#	0.085	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N004	-	1.46			#	0.017	
Oxidation Reduction Potential	mV	11/19/2013	N001	-	-35		F	#		
Oxidation Reduction Potential	mV	11/19/2013	N002	-	155		F	#		
Oxidation Reduction Potential	mV	11/19/2013	N003	-	95		F	#		
Oxidation Reduction Potential	mV	11/19/2013	N004	-	50			#		
pH	s.u.	11/19/2013	N001	-	6.9		F	#		
pH	s.u.	11/19/2013	N002	-	6.71		F	#		
pH	s.u.	11/19/2013	N003	-	6.71		F	#		
pH	s.u.	11/19/2013	N004	-	6.71			#		
Potassium	mg/L	11/19/2013	0001	-	9.25	E	F	#	0.05	
Potassium	mg/L	11/19/2013	N002	-	10.9	E	F	#	0.05	
Potassium	mg/L	11/19/2013	N003	-	11.5	E	F	#	0.05	
Potassium	mg/L	11/19/2013	N004	-	11.8	E		#	0.05	
Selenium	mg/L	11/19/2013	0001	-	0.0075	U	F	#	0.0075	
Selenium	mg/L	11/19/2013	N002	-	0.00865	B	F	#	0.0075	
Selenium	mg/L	11/19/2013	N003	-	0.00839	B	F	#	0.0075	

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: I(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	11/19/2013	N004	-	0.0077	B		#	0.0075	
Sodium	mg/L	11/19/2013	0001	-	227		F	#	0.1	
Sodium	mg/L	11/19/2013	N002	-	249		F	#	0.1	
Sodium	mg/L	11/19/2013	N003	-	262		F	#	0.1	
Sodium	mg/L	11/19/2013	N004	-	262			#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	-	2070		F	#		
Specific Conductance	umhos /cm	11/19/2013	N002	-	2735		F	#		
Specific Conductance	umhos /cm	11/19/2013	N003	-	2745		F	#		
Specific Conductance	umhos /cm	11/19/2013	N004	-	2705			#		
Sulfate	mg/L	11/19/2013	0001	-	601		F	#	6.65	
Sulfate	mg/L	11/19/2013	N002	-	902		F	#	13.3	
Sulfate	mg/L	11/19/2013	N003	-	948		F	#	13.3	
Sulfate	mg/L	11/19/2013	N004	-	887			#	13.3	
Temperature	C	11/19/2013	N001	-	15.2		F	#		
Temperature	C	11/19/2013	N002	-	14		F	#		
Temperature	C	11/19/2013	N003	-	14.5		F	#		
Temperature	C	11/19/2013	N004	-	16.7			#		
Total Dissolved Solids	mg/L	11/19/2013	0001	-	1570		F	#	3.4	
Total Dissolved Solids	mg/L	11/19/2013	N002	-	2220		F	#	3.4	
Total Dissolved Solids	mg/L	11/19/2013	N003	-	2210		F	#	3.4	
Total Dissolved Solids	mg/L	11/19/2013	N004	-	2230			#	3.4	
Turbidity	NTU	11/19/2013	N001	-	12.3		F	#		
Turbidity	NTU	11/19/2013	N002	-	1.1		F	#		

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: I(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Turbidity	NTU	11/19/2013	N003	-	0.97		F	#		
Turbidity	NTU	11/19/2013	N004	-	2.72			#		
Uranium	mg/L	11/19/2013	0001	-	0.149		F	#	0.00067	
Uranium	mg/L	11/19/2013	N002	-	0.324		F	#	0.00067	
Uranium	mg/L	11/19/2013	N003	-	0.334		F	#	0.00067	
Uranium	mg/L	11/19/2013	N004	-	0.346			#	0.00067	
Uranium-234	pCi/L	11/19/2013	0001	-	49.9		F	#	0.175	6.37
Uranium-234	pCi/L	11/19/2013	N002	-	105		F	#	0.162	13.1
Uranium-234	pCi/L	11/19/2013	N003	-	110		F	#	0.188	13.9
Uranium-234	pCi/L	11/19/2013	N004	-	53.4			#	0.172	7.15
Uranium-235/236	pCi/L	11/19/2013	0001	-	2.48		F	#	0.187	0.536
Uranium-235/236	pCi/L	11/19/2013	N002	-	5.74		F	#	0.0545	0.944
Uranium-235/236	pCi/L	11/19/2013	N003	-	4.98		F	#	0.161	0.887
Uranium-235/236	pCi/L	11/19/2013	N004	-	3.06			#	0.0833	0.696
Uranium-238	pCi/L	11/19/2013	0001	-	49.1		F	#	0.151	6.27
Uranium-238	pCi/L	11/19/2013	N002	-	103		F	#	0.181	12.8
Uranium-238	pCi/L	11/19/2013	N003	-	106		F	#	0.13	13.3
Uranium-238	pCi/L	11/19/2013	N004	-	54			#	0.172	7.22

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: L(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	-	557		F	#		
Arsenic	mg/L	11/19/2013	N001	-	0.0085	U	F	#	0.0085	
Calcium	mg/L	11/19/2013	N001	-	129		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	-	203		F	#	3.35	
Dissolved Oxygen	mg/L	11/19/2013	N001	-	0.98		F	#		
Magnesium	mg/L	11/19/2013	N001	-	67.1		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	-	0.000657	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	-	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/19/2013	N001	-	-63.5		F	#		
pH	s.u.	11/19/2013	N001	-	6.76		F	#		
Potassium	mg/L	11/19/2013	N001	-	7.53	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	-	0.0075	U	F	#	0.0075	
Sodium	mg/L	11/19/2013	N001	-	320		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	-	2531		F	#		
Sulfate	mg/L	11/19/2013	N001	-	630		F	#	6.65	
Temperature	C	11/19/2013	N001	-	14.87		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	-	1770		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	-	1.11		F	#		
Uranium	mg/L	11/19/2013	N001	-	0.00294		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	-	1.33		F	#	0.291	0.384
Uranium-235/236	pCi/L	11/19/2013	N001	-	0.141		UF	#	0.0706	0.132
Uranium-238	pCi/L	11/19/2013	N001	-	1.2		F	#	0.211	0.348

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 1/29/2014

Location: OBS-3 WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/20/2013	0001	152.4 - 350	38			#		
Arsenic	mg/L	11/20/2013	0001	152.4 - 350	0.0017	U		#	0.0017	
Calcium	mg/L	11/20/2013	0001	152.4 - 350	128			#	0.05	
Chloride	mg/L	11/20/2013	0001	152.4 - 350	622			#	13.4	
Dissolved Oxygen	mg/L	11/20/2013	N001	152.4 - 350	0.51			#		
Magnesium	mg/L	11/20/2013	0001	152.4 - 350	136			#	0.11	
Molybdenum	mg/L	11/20/2013	0001	152.4 - 350	0.000852	*		#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	0001	152.4 - 350	0.0256	J		#	0.017	
Oxidation Reduction Potential	mV	11/20/2013	N001	152.4 - 350	-185			#		
pH	s.u.	11/20/2013	N001	152.4 - 350	7.35			#		
Potassium	mg/L	11/20/2013	0001	152.4 - 350	11.9	E		#	0.05	
Selenium	mg/L	11/20/2013	0001	152.4 - 350	0.0015	U		#	0.0015	
Sodium	mg/L	11/20/2013	0001	152.4 - 350	372			#	0.1	
Specific Conductance	umhos /cm	11/20/2013	N001	152.4 - 350	3240			#		
Sulfate	mg/L	11/20/2013	0001	152.4 - 350	999			#	26.6	
Temperature	C	11/20/2013	N001	152.4 - 350	15.4			#		
Total Dissolved Solids	mg/L	11/20/2013	0001	152.4 - 350	2390			#	3.4	
Turbidity	NTU	11/20/2013	N001	152.4 - 350	55.3			#		
Uranium	mg/L	11/20/2013	0001	152.4 - 350	0.00931			#	0.000067	
Uranium-234	pCi/L	11/20/2013	0001	152.4 - 350	3.05			#	0.212	0.649
Uranium-235/236	pCi/L	11/20/2013	0001	152.4 - 350	0.273		U	#	0.209	0.203
Uranium-238	pCi/L	11/20/2013	0001	152.4 - 350	2.56			#	0.244	0.582

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: S(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/20/2013	0001	159 - 280	432			#		
Arsenic	mg/L	11/20/2013	0001	159 - 280	0.0017	U		#	0.0017	
Calcium	mg/L	11/20/2013	0001	159 - 280	283			#	0.05	
Chloride	mg/L	11/20/2013	0001	159 - 280	485			#	13.4	
Dissolved Oxygen	mg/L	11/20/2013	N001	159 - 280	3.41			#		
Magnesium	mg/L	11/20/2013	0001	159 - 280	160			#	0.11	
Molybdenum	mg/L	11/20/2013	0001	159 - 280	0.00226	*		#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	0001	159 - 280	2.61			#	0.085	
Oxidation Reduction Potential	mV	11/20/2013	N001	159 - 280	-40			#		
pH	s.u.	11/20/2013	N001	159 - 280	6.87			#		
Potassium	mg/L	11/20/2013	0001	159 - 280	12.7	E		#	0.05	
Selenium	mg/L	11/20/2013	0001	159 - 280	0.00897			#	0.0015	
Sodium	mg/L	11/20/2013	0001	159 - 280	388			#	0.1	
Specific Conductance	umhos /cm	11/20/2013	N001	159 - 280	3635			#		
Sulfate	mg/L	11/20/2013	0001	159 - 280	1190			#	26.6	
Temperature	C	11/20/2013	N001	159 - 280	14.9			#		
Total Dissolved Solids	mg/L	11/20/2013	0001	159 - 280	2950			#	3.4	
Turbidity	NTU	11/20/2013	N001	159 - 280	13.2			#		
Uranium	mg/L	11/20/2013	0001	159 - 280	0.525			#	0.000067	
Uranium-234	pCi/L	11/20/2013	0001	159 - 280	163			#	0.449	22.3
Uranium-235/236	pCi/L	11/20/2013	0001	159 - 280	7.52			#	0.475	1.48
Uranium-238	pCi/L	11/20/2013	0001	159 - 280	176			#	0.299	24

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: X(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	123	-	132	200		F	#		
Aroclor - 1016	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Aroclor - 1221	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Aroclor - 1232	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Aroclor - 1242	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Aroclor - 1248	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Aroclor - 1254	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Aroclor - 1260	ug/L	11/19/2013	N001	123	-	132	0.0333	U	F	#	0.0333	
Arsenic	mg/L	11/19/2013	N001	123	-	132	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	123	-	132	165		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	123	-	132	195		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	123	-	132	3.07		F	#		
Magnesium	mg/L	11/19/2013	N001	123	-	132	46.7		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	123	-	132	0.00181	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	123	-	132	8.71		F	#	0.17	
Oxidation Reduction Potential	mV	11/19/2013	N001	123	-	132	18.9		F	#		
pH	s.u.	11/19/2013	N001	123	-	132	7.69		F	#		
Potassium	mg/L	11/19/2013	N001	123	-	132	5.49	E	JF	#	0.05	
Selenium	mg/L	11/19/2013	N001	123	-	132	0.00659		F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	123	-	132	183		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	123	-	132	1920		F	#		

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: X(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sulfate	mg/L	11/19/2013	N001	123	-	132	504		F	#	6.65	
Temperature	C	11/19/2013	N001	123	-	132	14.58		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	123	-	132	1310		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	123	-	132	2.52		F	#		
Uranium	mg/L	11/19/2013	N001	123	-	132	0.145		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	123	-	132	47.8		F	#	0.239	6.4
Uranium-235/236	pCi/L	11/19/2013	N001	123	-	132	1.77		F	#	0.205	0.493
Uranium-238	pCi/L	11/19/2013	N001	123	-	132	44.8		F	#	0.166	6.02

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: Y2(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	11/19/2013	N001	98	-	123	205		F	#		
Aroclor - 1016	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Aroclor - 1221	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Aroclor - 1232	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Aroclor - 1242	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Aroclor - 1248	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Aroclor - 1254	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Aroclor - 1260	ug/L	11/19/2013	N001	98	-	123	0.034	U	F	#	0.034	
Arsenic	mg/L	11/19/2013	N001	98	-	123	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/19/2013	N001	98	-	123	56.5		F	#	0.05	
Chloride	mg/L	11/19/2013	N001	98	-	123	17.3		F	#	1.34	
Dissolved Oxygen	mg/L	11/19/2013	N001	98	-	123	5.89		F	#		
Magnesium	mg/L	11/19/2013	N001	98	-	123	16.6		F	#	0.11	
Molybdenum	mg/L	11/19/2013	N001	98	-	123	0.00255	*	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	98	-	123	1.66		F	#	0.085	
Oxidation Reduction Potential	mV	11/19/2013	N001	98	-	123	-29		F	#		
pH	s.u.	11/19/2013	N001	98	-	123	7.63		F	#		
Potassium	mg/L	11/19/2013	N001	98	-	123	2.92	E	F	#	0.05	
Selenium	mg/L	11/19/2013	N001	98	-	123	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/19/2013	N001	98	-	123	54.1		F	#	0.1	
Specific Conductance	umhos /cm	11/19/2013	N001	98	-	123	643		F	#		

General Water Quality Data by Location (USEE105) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014
Location: Y2(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sulfate	mg/L	11/19/2013	N001	98 - 123	101		F	#	2.66	
Temperature	C	11/19/2013	N001	98 - 123	15.94		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	98 - 123	404		F	#	3.4	
Turbidity	NTU	11/19/2013	N001	98 - 123	2.01		F	#		
Uranium	mg/L	11/19/2013	N001	98 - 123	0.0053		F	#	0.000067	
Uranium-234	pCi/L	11/19/2013	N001	98 - 123	2.97		F	#	0.402	0.652
Uranium-235/236	pCi/L	11/19/2013	N001	98 - 123	0.288	U	F	#	0.288	0.114
Uranium-238	pCi/L	11/19/2013	N001	98 - 123	1.94		F	#	0.233	0.48

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/29/2014

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
11(SG)		6639.19	11/19/2013	09:05:09	205.7	6433.49	
13(SG)		6593.57	11/19/2013	16:30:07	167.08	6426.49	
14(SG)		6617.2	11/19/2013	11:35:13	189	6428.2	
15(SG)		6612.53	11/19/2013	12:45:44	185.4	6427.13	
16(SG)		6618.25	11/19/2013	09:15:46	186.02	6432.23	
18(SG)		6601.32	11/19/2013	14:50:22	174.02	6427.30	
20(M)		6613.38	11/19/2013	10:55:50	105.64	6507.74	
21(M)		6593.8	11/19/2013	15:40:11	128.28	6465.52	
22(M)		6606.48	11/19/2013	10:30:58	137.23	6469.25	
23(M)		6579.22	11/19/2013	16:15:46	110.2	6469.02	
E(M)		6616.32	11/19/2013	12:50:19	81.39	6534.93	
F(M)		6603.59	11/19/2013	15:30:48	113.35	6490.24	
HMC-951		6576.79	11/20/2013	09:15:55	151.9	6424.89	
I(SG)		6625.93	11/19/2013	10:05:29	199.74	6426.19	
I(SG)		6625.93	11/19/2013	11:05:44	199.74	6426.19	
I(SG)		6625.93	11/19/2013	12:15:27	199.74	6426.19	
I(SG)		6625.93	11/19/2013	14:05:33	199.74	6426.19	
L(SG)		6606.09	11/19/2013	10:25:26	164	6442.09	
OBS-3		6617.22	11/20/2013	11:30:14	184.9	6432.32	
S(SG)		6625.25	11/20/2013	12:45:05			B
T(M)		6612.65	11/19/2013	10:59:00			D
X(M)		6598.91	11/19/2013	14:45:50	132.02	6466.89	
Y2(M)		6614.13	11/19/2013	14:05:34	117.2	6496.93	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
N UNKNOWN O ON SITE U UPGRADIENT

WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

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Time-Concentration Graphs

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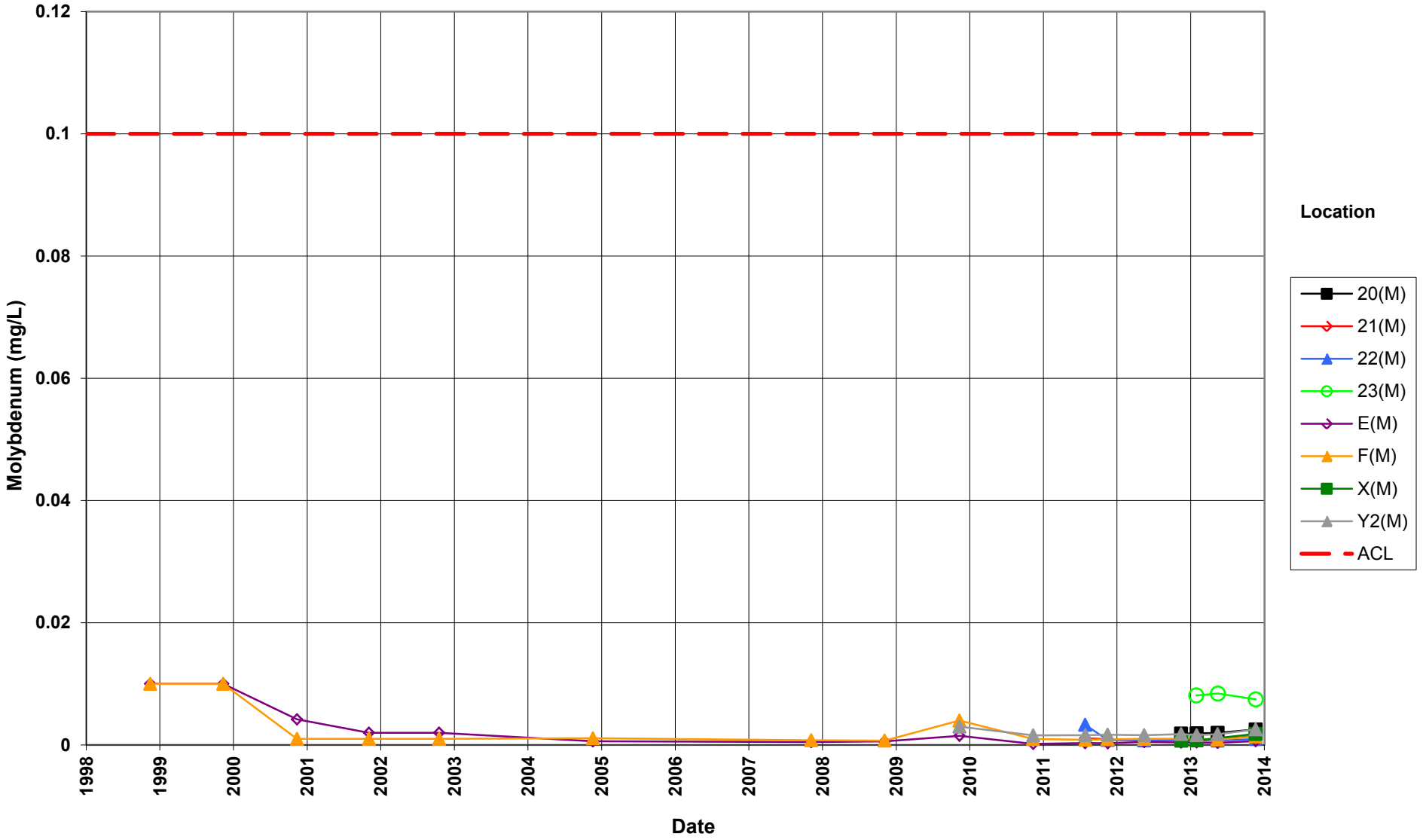
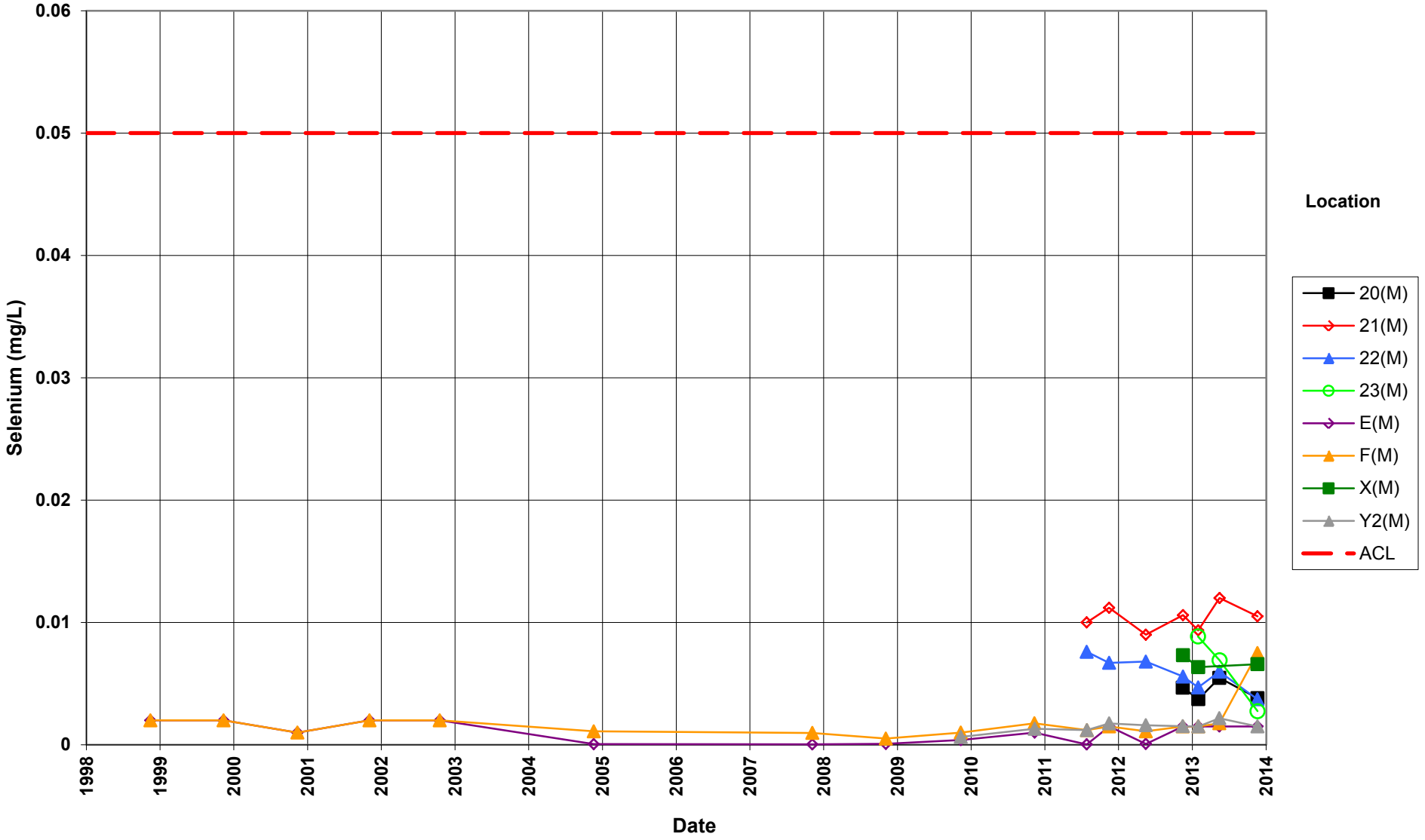
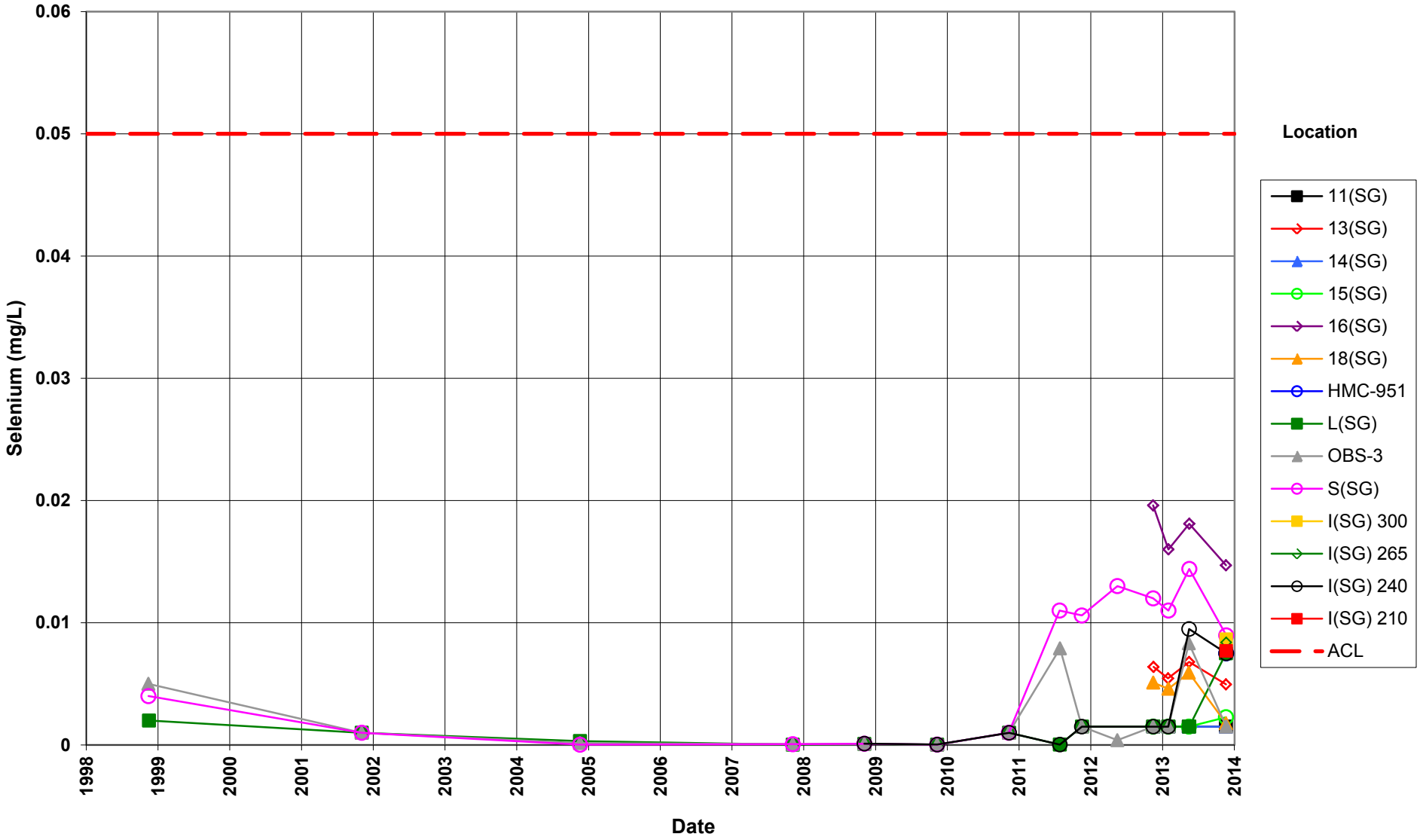
Bluewater Disposal Site
Alluvium Wells
Molybdenum Concentration
Alternate Concentration Limit (ACL) = 0.10 mg/L



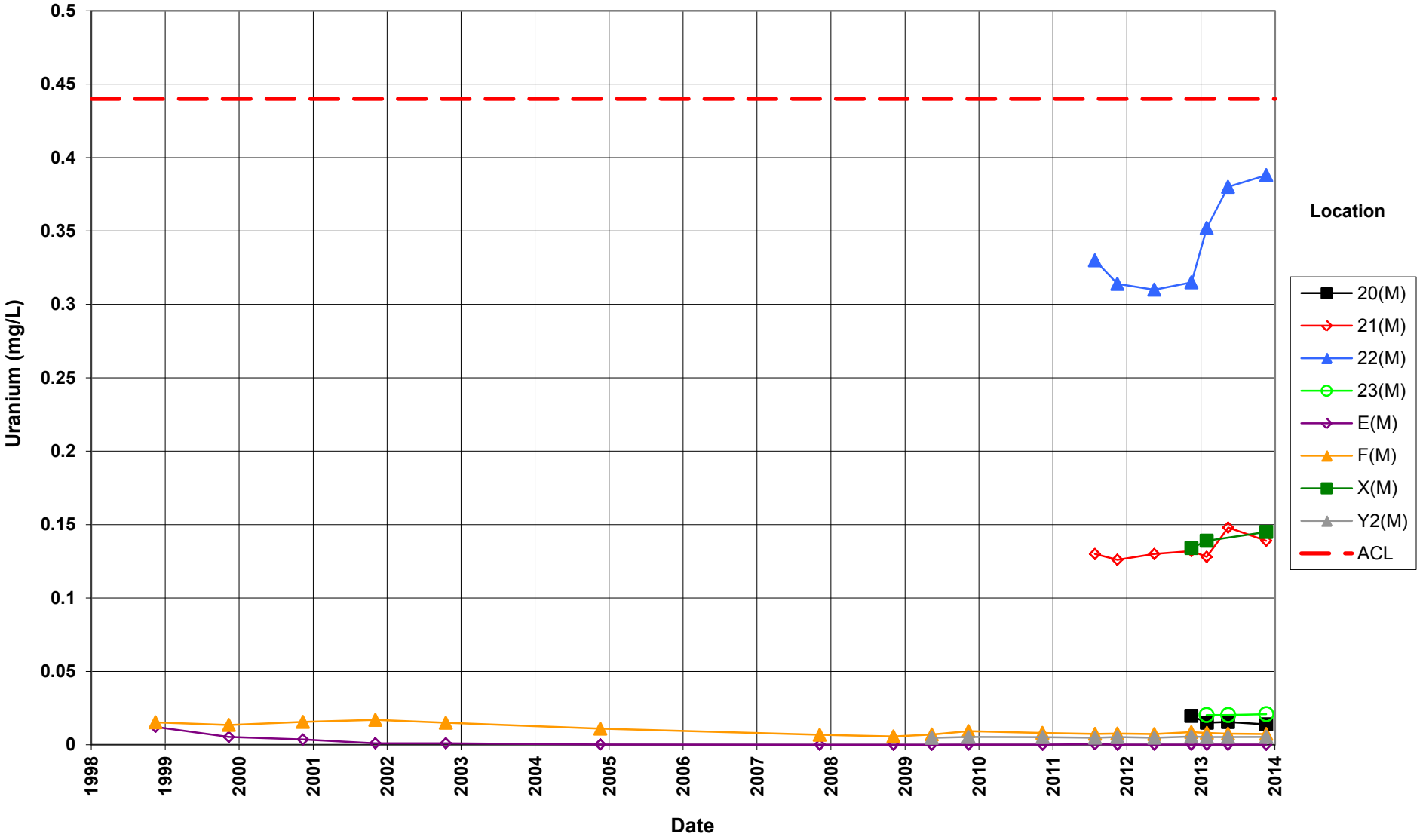
Bluewater Disposal Site
Alluvium Wells
Selenium Concentration
Alternate Concentration Limit (ACL) = 0.05 mg/L



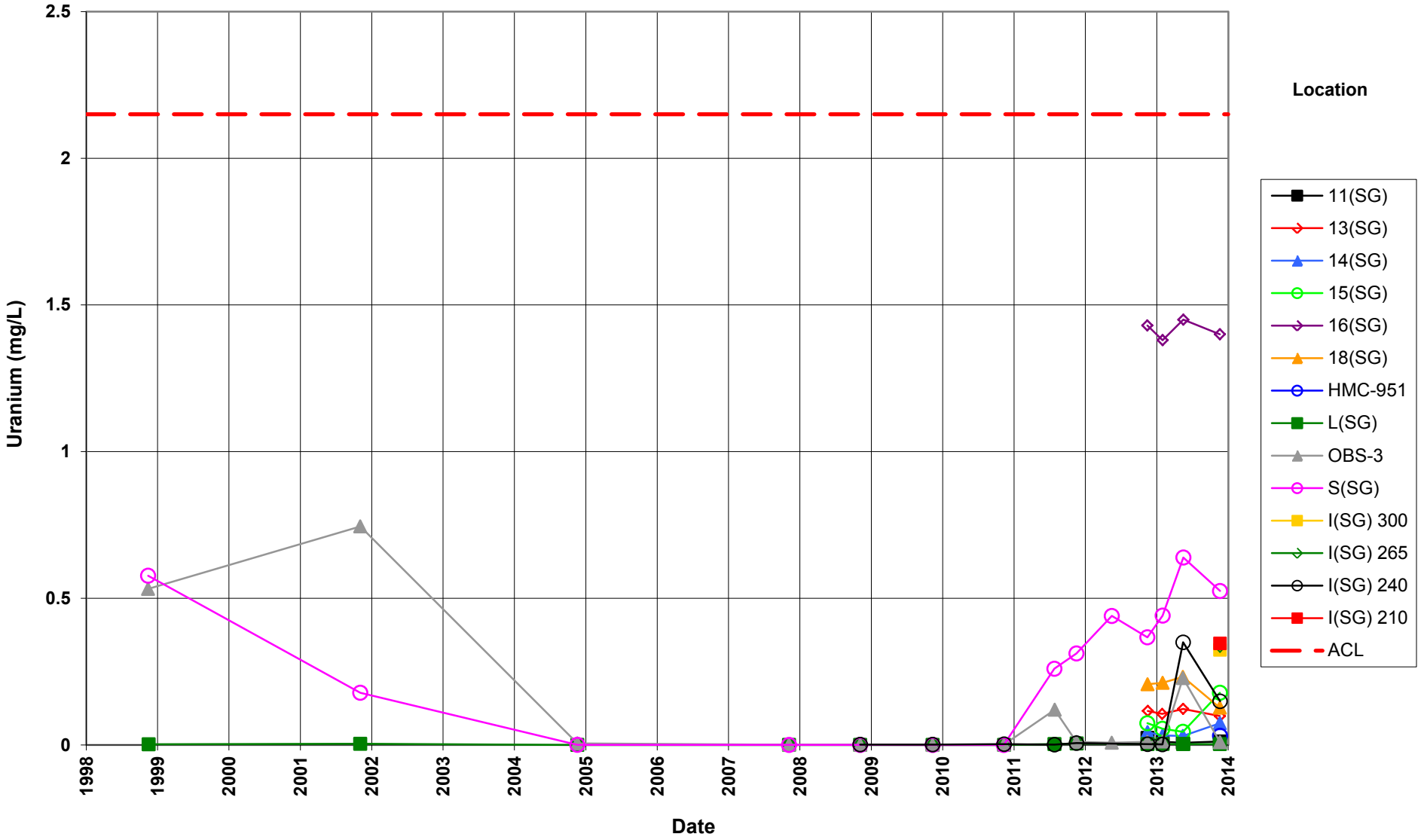
Bluewater Disposal Site
Bedrock Wells
Selenium Concentration
Alternate Concentration Limit (ACL) = 0.05 mg/L



Bluewater Disposal Site
Alluvium Wells
Uranium Concentration
Alternate Concentration Limit (ACL) = 0.10 mg/L



Bluewater Disposal Site
Bedrock Wells
Uranium Concentration
Alternate Concentration Limit (ACL) = 2.15 mg/L



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Attachment 3
Sampling and Analysis Work Order

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Task Order LM-501
Control Number 14-0037

October 14, 2013

U.S. Department of Energy
Office of Legacy Management
ATTN: Deborah Barr
Site Manager
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller) November 2013 Environmental Sampling at the Bluewater, New Mexico, Disposal Site

REFERENCE: Task Order LM00-501-03-203-402, Bluewater, New Mexico, Disposal Site

Dear Ms. Barr:

The purpose of this letter is to inform you of the upcoming sampling event at Bluewater, New Mexico. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Bluewater site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of November 11, 2013.

The following list shows the monitoring and private wells (with zone of completion) scheduled for sampling during this event.

Monitoring Wells*

E(M) Al	T(M) Al	S(SG) Sg	11(SG) Sg	15(SG) Sg	20(M) Al	22(M) Al
Y2(M) Al	X(M) Al	OBS-3 Sg	13(SG) Sg	16(SG) Sg	21(M) Al	23(M) Al
F(M) Al	L(SG) Sg	I(SG) Sg	14(SG) Sg	18(SG) Sg		

Private Well
HMC-951 Sg

*NOTE: Al = alluvium; Sg = San Andres-Glorieta

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

Please contact me at (970) 248-6022 if you have any questions.

Sincerely,

Richard K. Johnson
Site Lead

RKJ/lcg/lb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Richard Johnson, Stoller
EDD Delivery
rc-grand.junction
File: BLU 410.02(A)

Constituent Sampling Breakdown

Site	Bluewater				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	21	0			
Field Measurements					
Alkalinity	X				
Dissolved Oxygen	X				
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Arsenic	X		0.0001	SW-846 6020	LMM-02
Bicarbonate					
Calcium	X		5	SW-846 6010	LMM-01
Carbonate					
Chloride	X		0.5	SW-846 9056	WCH-A-039
Lead					
Magnesium	X		5	SW-846 6010	LMM-01
Manganese					
Molybdenum	X		0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N	X		0.05	EPA 353.1	WCH-A-022
Oxygen-18					
PCBs	E(M), Y2(M), F(M), T(M), and X(M) only (November only)		0.0005	SW-846 8082	PEP-A-006
Potassium	X		1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium	X		0.0001	SW-846 6020	LMM-02
Silica					
Sodium	X		1	SW-846 6010	LMM-01
Strontium					
Sulfate	X		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	X		10	SM2540 C	WCH-A-033
Tritium			3 pCi/L	HASL 300 H-02-RC	LMR-17
Uranium	X		0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	13	0			

Note: All analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered.

The total number of analytes does not include field parameters.

Sampling Frequencies for Locations at Bluewater, New Mexico

Location ID	Quarterly	Semiannually	Annually	Triennially	Not Sampled	Notes
Monitoring Wells						
E(M)		X				PCBs in November only
Y2(M)		X				PCBs in November only
F(M)		X				PCBs in November only
T(M)		X				PCBs in November only
X(M)		X				
L(SG)		X				
S(SG)		X				
OBS-3		X				
I(SG)		X				
11(SG)		X				
13(SG)		X				
14(SG)		X				
15(SG)		X				
16(SG)		X				
18(SG)		X				
20(M)		X				
21(M)		X				
22(M)		X				
23(M)		X				May be dry
Private Wells						
HMC-951		X				

Sampling conducted in May and November.

Attachment 4
Trip Report

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Grand Junction Office
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Memorandum

DATE: December 10, 2013

TO: Dick Johnson

FROM: Alison Kuhlman

SUBJECT: Sampling Trip Report

Site: Bluewater, NM Site

Dates of Sampling Event: November 19, 2013 – November 21, 2013

Team Members: Jeff Price, Joe Trevino, Dan Sellers, David Atkinson, Gretchen Baer, and Alison Kuhlman

Number of Locations Sampled: Samples were collected at 19 of the 20 monitoring well locations identified on the sampling notification letter. An additional three samples were collected at varying depths at one of those locations. A total of 22 groundwater samples and 2 QC duplicate samples were collected.

Locations Not Sampled/Reason: Location T(M) was dry. Sampling was attempted with the installed bladder pump, but not enough water was present. The pump was pulled and bailing was attempted. There was not enough water present to bail.

Location Specific Information:

TICKET NUMBER	SAMPLE DATE	LOCATION	COMMENTS
LMS 327	11/19/2013	13(SG)	The ORP measurement was lower than November 2012 readings. Immediately after sampling the well, the ORP probe was checked with Zobell. The reading was acceptable.
LMS 315	11/19/2013	E(M)	PCB triplicate was taken. CAT II well. Turbidity not met, samples were filtered but the three 1 liter samples of PCB were not filtered, per the SAP.
LMS 333	11/20/2013	HMC-951	Installed a 3-inch, 20 gpm pump at 180 feet below surface; will leave pump for future sampling events. Use a 5kw generator to power pump.
LMS 337	11/19/2013	I(SG)	Sample collected from 265 feet.
LMS 338	11/19/2013	I(SG)	Sample collected from 240 feet.
LMS 339	11/19/2013	I(SG)	Sampled with high flow procedure. 3 casing volume purge and sample. Pump intake at 210 feet.
LMS 319	11/19/2013	I(SG)	Sample collected at 300 feet. Current sample depth is at 300 feet.
LMS 320	11/19/2013	L(SG)	The well was sampled at an intake depth of 510 feet.
LMS 318	11/20/2013	OBS-3	Purged well dry. Samples were collected after well had recovered sufficiently.
LMS 321	11/20/2013	S(SG)	Water level is down to intake of pump –only the casing storage of 530 gallons was purged as the well went dry. Could not get water level tape down hole.

Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples. No equipment blank samples were collected because all equipment (pumps, tubing, fittings, etc.) used was either dedicated to a single well location or disposable.

FALSE ID	TRUE ID	SAMPLE TYPE	ASSOCIATED MATRIX	TICKET NUMBER
2074	15(SG)	Duplicate	Groundwater	LMS 322
2554	21(M)	Duplicate	Groundwater	LMS 336

RIN Number Assigned: All samples were assigned to RIN 13115746.

Sample Shipment: Samples were shipped overnight via FedEx to GEL labs in Charleston, SC, from Grants, NM, on November 21, 2013.

Water Level Measurements: Water levels were measured at all wells prior to the start of sampling with the exception of well S(SG) where the water level tape would not go down the hole. The water level of 134.17 feet at well T(M) was NOT entered into the database. The water level was below the screen and was likely to be stagnant water retained in the sump. It is probably not an accurate water level for the location.

Well Inspection Summary: No issues were identified.

Sampling Method: Samples were collected according to the *Sampling and Analysis Plan for the U.S. Department of Energy Office Management Sites* (LMS/PRO/S04351, continually updated). Groundwater samples at monitoring well locations S(SG) and OBS-3 were collected according to the Bluewater Groundwater Sampling Program Directive (BLU-2013-01, effective date 10/1/2012, expiration date 9/30/2014).

Field Variance:

LOCATION ID	COMMENTS
E(M)	Turbidity not met, samples were filtered.
S(SG)	The water level was down to the intake of the pump, therefore only one casing volume of 530 gallons was purged and not the 3 casing volumes, totaling 820 gallons, required by the program directive.

Equipment: All equipment functioned properly.

Institutional Controls:

Fences, Gates, Locks: A 3359 lock was added to the "daisy chain" on the gate near well HCM-951.
Signs: No issues identified.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: None.
Maintenance Requirements: None
Access Issues: None

Corrective Action Required: None.

cc: (electronic)
Deborah Barr, DOE
Linda Berry, Stoller
Steve Donivan, Stoller
Dick Johnson, Stoller
EDD Delivery

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