

Data Validation Package

April 2014
Groundwater Sampling at the
Bluewater, New Mexico, Disposal Site

September 2014



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Bluewater, New Mexico, Disposal Site

Sampling Period: April 29–30, 2014

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/S04351, continually updated). A duplicate sample was collected from location HMC-951.

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 (San Andres aquifer) and are identified by the suffix (SG). Wells HMC-951 and OBS-3 are also completed in the San Andres 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 characterize the site aquifers and to support a regional groundwater investigation being conducted by the New Mexico Environment Department. The list included analytes for tritium, uranium isotopes, and the determination of hydrogen, oxygen, and sulfur stable isotope ratios.

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 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; the most recent sample was collected in May 2012 and had a uranium concentration of 0.55 milligrams per liter (mg/L).

Analytical results for the required constituents for the alluvium wells are provided in Table 1. The uranium concentration was 0.137 mg/L in well 21(M), and was 0.121 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) and the New Mexico drinking water standard of 0.03 mg/L. 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 0.0262 mg/L.

Table 1. April 2014 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	0.0021	ND	0.0143
21(M)	Downgradient	0.0010	0.0121	0.137
22(M)	Downgradient	0.0010	ND	0.393
23(M)	Downgradient	0.0057	ND	0.0262
E(M)	Background	0.0006	ND	ND
F(M)	POC	0.0010	ND	0.0078
T(M)	POC	Not Sampled	Not Sampled	Not Sampled
X(M)	POE	0.0007	0.0079	0.121
Y2(M)	PCBs	0.0016	ND	0.0051

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 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). The results from wells OBS-3 and S(SG) are not considered representative of the aquifer but continue to be sampled in accordance with the LTSP.

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 aquifer wells onsite, except well 16(SG), are screened in the upper 50 feet of the San Andres Limestone as are most San Andres 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, two zones of different conductivities were noted in POE well I(SG). During this sampling event, a low-flow sample was collected from well I(SG) at a depth of 265 feet in the zone of highest conductivity.

Offsite private well HMC-951, located near the site entrance and used only for monitoring purposes, was sampled by DOE for the second 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, a sample was collected using a submersible pump inside the well casing at a depth of 180 feet 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 and the New Mexico drinking water standard. The uranium concentration at the sampled depth in POE well I(SG) also exceeded these standards. The uranium concentration in HMC-951 exceeded the New Mexico drinking water standard. Therefore, San Andres 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. April 2014 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	0.0157
13(SG)	Downgradient	ND	0.108
14(SG)	Upgradient	ND	0.0643
15(SG)	Downgradient	ND	0.129
16(SG)	Downgradient	0.0171	1.29
18(SG)	Downgradient	ND	0.134
HMC-951	Offsite	ND	0.0317
I(SG) 265 feet	POE	0.0081	0.288
L(SG)	Background	ND	0.0031
OBS-3	POC	ND	0.0077
S(SG)	POC	0.0122	0.456

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
 The S.M. Stoller Corporation,
 a wholly owned subsidiary of
 Huntington Ingalls Industries

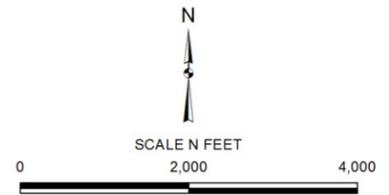
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LEGEND

- DOE WELL TO BE SAMPLED
- PRIVATE WELL TO BE SAMPLED
- - - SITE BOUNDARY



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00050
Planned Sampling Map Bluewater, NM, Disposal Site May 2014	
DATE PREPARED: April 8, 2014	FILENAME: S1169400

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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, New Mexico	Date(s) of Water Sampling	April 29–30, 2014
Date(s) of Verification	August 19, 2014	Name of Verifier	Stephen Donovan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List any Program Directives or other documents, SOPs, instructions.	Yes	Program Directive BLU-2013-01. Work Order letter dated April 17, 2014.
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	Calibrations were performed on April 28, 2014.
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	Yes Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Were wells categorized correctly?	No	Wells HMC-951, OBS-3, and S(SG) were categorized incorrectly as low-flow wells.
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling? Was the flow rate less than 500 mL/min?	Yes Yes Yes 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	A duplicate sample was collected at well HMC-951.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	An equipment blank was not required.
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?	Yes	
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): 14046116
Sample Event: April 29–30, 2013
Site(s): Bluewater, New Mexico
Laboratory: GEL Laboratories, Charleston, South Carolina
Work Order No.: 347913
Analysis: Metals, Organics, Wet Chemistry, and Radiochemistry
Validator: Stephen Donivan
Review Date: August 18, 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
Alkalinity, Bicarbonate	WCH-A-003	EPA 310.1/ SM 2320B	EPA 310.1/ SM 2320B
Alkalinity, Carbonate	WCH-A-004	EPA 310.1/ SM 2320B	EPA 310.1/ SM 2320B
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
Total Dissolved Solids	WCH-A-033	SM 2540C	SM 2540C
Tritium, Enrichment Method	LMR-17	HASL-300	HASL-300
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
347913001	11(SG)	Chloride	J	Analyzed outside of holding time
347913001	11(SG)	Molybdenum	U	Less than 5 times the method blank
347913001	11(SG)	Sulfate	J	Analyzed outside of holding time
347913001	11(SG)	Tritium	J	Less than the Determination Limit
347913002	13(SG)	Sulfate	J	Analyzed outside of holding time
347913002	13(SG)	Field Alkalinity	R	Cation/Anion Balance
347913004	15(SG)	Tritium	J	Less than the Determination Limit
347913004	15(SG)	Sulfate	J	Analyzed outside of holding time
347913005	16(SG)	Chloride	J	Analyzed outside of holding time
347913005	16(SG)	Tritium	J	Less than the Determination Limit
347913005	16(SG)	Sulfate	J	Analyzed outside of holding time
347913007	20(M)	Sulfate	J	Analyzed outside of holding time
347913007	20(M)	Uranium-235	J	Less than the Determination Limit
347913008	21(M)	Molybdenum	U	Less than 5 times the method blank
347913008	21(M)	Sulfate	J	Analyzed outside of holding time
347913009	22(M)	Molybdenum	U	Less than 5 times the method blank
347913010	23(M)	Tritium	J	Less than the Determination Limit
347913012	E(M)	Molybdenum	U	Less than 5 times the method blank
347913012	E(M)	Tritium	U	Less than the Decision Level Concentration
347913013	F(M)	Molybdenum	U	Less than 5 times the method blank
347913013	F(M)	Tritium	U	Less than the Decision Level Concentration
347913013	F(M)	Uranium-235	J	Less than the Determination Limit
347913014	HMC-951	Tritium	U	Less than the Decision Level Concentration
347913015	I(SG)	Tritium	U	Less than the Decision Level Concentration
347913016	L(SG)	Chloride	J	Analyzed outside of holding time
347913016	L(SG)	Molybdenum	U	Less than 5 times the method blank
347913016	L(SG)	Sulfate	J	Analyzed outside of holding time
347913017	OBS-3	Chloride	J	Analyzed outside of holding time
347913017	OBS-3	Tritium	U	Less than the Decision Level Concentration
347913017	OBS-3	Sulfate	J	Analyzed outside of holding time
347913018	S(SG)	Chloride	J	Analyzed outside of holding time
347913018	S(SG)	Tritium	U	Less than the Decision Level Concentration
347913018	S(SG)	Sulfate	J	Analyzed outside of holding time
347913019	X(M)	Chloride	J	Analyzed outside of holding time
347913019	X(M)	Molybdenum	U	Less than 5 times the method blank
347913019	X(M)	Tritium	U	Less than the Decision Level Concentration
347913019	X(M)	Sulfate	J	Analyzed outside of holding time
347913020	Y2(M)	Tritium	U	Less than the Decision Level Concentration

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received 20 water samples on May 2, 2014, 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.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler 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. For 10 of the samples, the chloride and sulfate were analyzed within holding time. However, the samples had to be diluted and reanalyzed and the reanalysis was one day past the holding time. The associated sample chloride and sulfate results are qualified with a “J” flag as estimated values.

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. The 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.

Methods EPA 310.1/SM 2320B, SM 2540C

There are no initial or continuing calibration requirements associated with the alkalinity or total dissolved solids methods.

Method EPA 300.0

Calibrations for chloride and sulfate were performed using seven calibration standards on April 14, 2014. 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 June 26, 2014, 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.

Method SW-846 6020A

Calibrations were performed for arsenic, molybdenum, selenium, and uranium on July 30–31 and August 1, 2014, using two calibration standards. 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.

Alpha Spectrometry

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 (FWHM) was reviewed to evaluate the spectral resolution. All internal standard FWHM values were below 100 kiloelectron volts (keV), demonstrating acceptable resolution. All internal standard peaks were within 50 keV of the expected position. The regions of interest (ROIs) for analyte peaks were reviewed. No manual integrations were performed and all ROIs were satisfactory. All results were blank-corrected using data from a blank population.

Tritium

The tritium quench calibration curve was generated on July 24, 2013, for quench numbers ranging from 592 to 761. Sample quench values were within the calibration range for all samples. Daily calibration checks were performed on June 28, 29, and July 27, 2014, with acceptable results.

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.)

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. (The spike recoveries for chloride, nitrate, and sulfate exceeded the laboratory’s acceptance criteria, but were within the ± 25 percent validation 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.

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.

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 ion chromatography data. All peak 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.

The charge balance value for most locations was less than ten percent, with the following exceptions. At location 13(SG), the field and laboratory alkalinity results are not in agreement. The charge balance using the field result is 22.8 percent and the charge balance using the laboratory result is 0.5 percent. The field result is judged to be erroneous and is qualified with an “R” flag as rejected.

At location 16(SG) the charge balance was above 10 percent. The chloride and sulfate results were greater than the historical maximum values, biasing the calculated charge balance. These data were qualified previously because of the missed holding time. Further review of these data did not indicate any additional errors in the laboratory data and the data were not further qualified.

Electronic Data Deliverable (EDD) File

The EDD file arrived on August 4, 2014. 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.

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

Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
11(SG)	29.82	33.13	5.26
13(SG)	18.02	18.21	0.5
14(SG)	22.49	23.36	1.7
15(SG)	19.80	22.43	6.22
16(SG)	46.52	66.24	17.49
18(SG)	19.23	19.47	0.6
20(M)	14.18	16.10	6.32
21(M)	20.38	21.36	2.36
22(M)	13.86	14.09	0.86
23(M)	10.81	11.30	2.2
E(M)	17.13	18.00	2.5
F(M)	6.03	6.09	0.5
HMC-951	14.56	16.17	5.2
I(SG)	34.58	36.64	2.9
L(SG)	29.01	29.93	1.56
OBS-3	36.43	39.67	4.26
S(SG)	44.68	50.57	6.19
X(M)	19.55	21.89	5.66
Y2(M)	6.70	6.99	2.1

meq/L = milliequivalents per liter

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 14046116 Lab Code: GEN Validator: Stephen Donovan Validation Date: 08/15/2014
Project: Bluewater Analysis Type: Metals General Chem Rad Organics
of Samples: 20 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

- | | |
|--|--|
| <input checked="" type="checkbox"/> Holding Times | There are 16 holding time failures. |
| <input checked="" type="checkbox"/> Detection Limits | There are 40 detection limit failures. |
| <input type="checkbox"/> Field/Trip Blanks | |
| <input checked="" type="checkbox"/> Field Duplicates | There was 1 duplicate evaluated. |

SAMPLE MANAGEMENT SYSTEM

RIN: 14046116 Lab Code: GEN

Non-Compliance Report: Holding Times

Project: Bluewater

Validation Date: 08/15/2014

Ticket	Location	Lab Sample ID	Method Code	Holding Times			Criteria			Reported Dates		
				Collection to Preparation	Preparation to Analysis	Collection to Analysis	Collection to Preparation	Preparation to Analysis	Collection to Analysis	Collection Date	Preparation Date	Analysis Date
MFZ 206	OBS-3	347913017	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 206	OBS-3	347913017	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 208	L(SG)	347913016	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 208	L(SG)	347913016	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 209	S(SG)	347913018	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 209	S(SG)	347913018	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 210	Z1(M)	347913008	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 212	I1(SG)	347913001	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 212	I1(SG)	347913001	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 213	I3(SG)	347913002	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 215	I5(SG)	347913004	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 216	I6(SG)	347913005	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 216	I6(SG)	347913005	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 218	I20(M)	347913007	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 220	X(M)	347913019	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014
MFZ 220	X(M)	347913019	MIS-A-045		29				28	04/29/2014	05/28/2014	05/28/2014

SAMPLE MANAGEMENT SYSTEM
Metals Data Validation Worksheet

RIN: 14046116 Lab Code: GEN Date Due: 07/31/2014
 Matrix: Water Site Code: BLU01 Date Completed: 08/04/2014

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								
Arsenic	ICP/MS	08/01/2014			OK	OK	OK	97.3	102.0			100.0		92.0
Calcium	ICP/ES	06/26/2014	0.0000	1.0000	OK	OK	OK	100.0			4.0	94.0	1.2	93.0
Magnesium	ICP/ES	06/26/2014	0.0000	1.0000	OK	OK	OK	105.0	120.0		4.0	94.0	0.2	104.0
Molybdenum	ICP/MS	07/30/2014			OK	OK	OK	104.0	109.0		9.0	101.0		97.0
Potassium	ICP/ES	06/26/2014	0.0000	1.0000	OK	OK	OK	107.0	118.0		3.0	101.0	7.1	98.0
Selenium	ICP/MS	08/01/2014			OK	OK	OK	103.0	101.0			96.0		103.0
Sodium	ICP/ES	06/26/2014	0.0000	1.0000	OK	OK	OK	104.0			2.0	98.0	1.7	98.0
Uranium	ICP/MS	07/30/2014			OK	OK	OK	103.0	101.0		3.0	103.0	1.5	111.0

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 14046116 **Lab Code:** GEN **Date Due:** 07/31/2014
Matrix: Water **Site Code:** BLU01 **Date Completed:** 08/04/2014

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate RER
11(SG)	Tritium	06/28/2014			71			
13(SG)	Tritium	06/28/2014			71			
14(SG)	Tritium	06/28/2014			71			
15(SG)	Tritium	06/28/2014			71			
16(SG)	Tritium	06/28/2014			71			
18(SG)	Tritium	06/28/2014			71			
20(M)	Tritium	06/28/2014			71			
21(M)	Tritium	06/29/2014			71			
22(M)	Tritium	06/29/2014			71			
23(M)	Tritium	06/29/2014			71			
2484	Tritium	06/29/2014			71			
Blank_Spike	Tritium	06/29/2014			71	92.2		
Blank	Tritium	06/29/2014	1.3	U	71			
E(M)	Tritium	07/27/2014			68			
F(M)	Tritium	07/27/2014			68			
HMC-951	Tritium	07/28/2014			68			
I(SG)	Tritium	07/28/2014			68			
L(SG)	Tritium	07/28/2014			68			
OBS-3	Tritium	07/28/2014			68			
S(SG)	Tritium	07/28/2014			68			
X(M)	Tritium	07/28/2014			68			
Y2(M)	Tritium	07/28/2014			68			
Blank_Spike	Tritium	07/29/2014			68	105		
Blank	Tritium	07/29/2014	-1.1	U	68			
11(SG)	Uranium-233+234	07/08/2014			91			
13(SG)	Uranium-233+234	07/08/2014			92			
14(SG)	Uranium-233+234	07/08/2014			79			
15(SG)	Uranium-233+234	07/08/2014			75			
16(SG)	Uranium-233+234	07/08/2014			44			
18(SG)	Uranium-233+234	07/08/2014			85			
20(M)	Uranium-233+234	07/08/2014			98			
21(M)	Uranium-233+234	07/08/2014			76			

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 14046116 **Lab Code:** GEN **Date Due:** 07/31/2014
Matrix: Water **Site Code:** BLU01 **Date Completed:** 08/04/2014

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate RER
22(M)	Uranium-233+234	07/08/2014			89			
23(M)	Uranium-233+234	07/08/2014			86			
2484	Uranium-233+234	07/08/2014			75			
F(M)	Uranium-233+234	07/08/2014			86			
HMC-951	Uranium-233+234	07/08/2014			90			
I(SG)	Uranium-233+234	07/08/2014			91			
L(SG)	Uranium-233+234	07/08/2014			86			
OBS-3	Uranium-233+234	07/08/2014			87			
S(SG)	Uranium-233+234	07/08/2014			78			
X(M)	Uranium-233+234	07/08/2014			79			
Y2(M)	Uranium-233+234	07/08/2014			74			
11	Uranium-233+234	07/08/2014			84			0.13
11	Uranium-233+234	07/08/2014			78			
Blank	Uranium-233+234	07/08/2014	-0.087	U	60			
E(M)	Uranium-233+234	07/12/2014			79			
Blank	Uranium-235	07/08/2014	0.071	U				
11	Uranium-235/236	07/08/2014						0.4
11	Uranium-235/236	07/08/2014						
11	Uranium-238	07/08/2014						0.39
Blank_Spike	Uranium-238	07/08/2014				99		
11	Uranium-238	07/08/2014					98.5	
Blank	Uranium-238	07/08/2014	-0.115	U				

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 14046116 **Lab Code:** GEN **Date Due:** 07/31/2014
Matrix: Water **Site Code:** BLU01 **Date Completed:** 08/04/2014

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
ALKALINITY, Total as CaCO3	05/10/2014					OK	95.60	85.5			
ALKALINITY, Total as CaCO3	05/13/2014					OK	95.60	95.6			
Bicarbonate alkalinity (CaCO3)	05/10/2014								1.00		
Bicarbonate alkalinity (CaCO3)	05/13/2014								1.00		
Carbonate alkalinity (CaCO3)	05/10/2014										
Carbonate alkalinity (CaCO3)	05/13/2014										
Chloride	05/27/2014	0.000	0.9998	OK	OK	OK	101.00				
Chloride	05/28/2014							114.0	0		
Chloride	05/28/2014								0		
NO2+NO3 as N	05/08/2014	0.000	1.0000	OK	OK	OK	110.00	89.3	4.00		
NO2+NO3 as N	05/08/2014							111.0			
Sulfate	05/27/2014	0.000	0.9998	OK	OK	OK	103.00				
Sulfate	05/28/2014							124.0	0		
Sulfate	05/28/2014								1.00		
Total Dissolved Solids	05/05/2014					OK	103.00		1.00		
Total Dissolved Solids	05/06/2014					OK	97.60		0		

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General Information

Requisition No. (RIN): 14046117
Sample Event: April 29-30, 2014
Site(s): Bluewater, New Mexico
Laboratory: Reston Stable Isotope Laboratory, Reston, Virginia
Analysis: Stable Isotopes
Validator: Stephen Donivan
Review Date: June 19, 2014

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325), "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 1, Data Deliverables Examination. 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 6.

Table 6. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
H-2/H-1 and O-18/O-16 Isotope Ratios	LMW-08	NA	Mass Spectrometry
S-34/S-32 Isotope Ratio	LMW-09	NA	Mass Spectrometry

Data Qualifier Summary

None of the analytical results required qualification.

Sample Shipping/Receiving

The Reston Stable Isotope Laboratory in Reston, Virginia received 20 water samples on May 2, 2014, submitted for the determination of stable hydrogen, oxygen, and sulfur isotope ratios. The analytical report was checked to confirm that all of the samples scheduled were received and analyzed.

Preservation and Holding Times

The sample shipment was received intact with the sample in the correct container type preserved correctly for the requested analyses. The sample was analyzed within the applicable holding time.

Laboratory Analysis

Oxygen and hydrogen isotopic results are reported in parts per thousand (per mill) relative to VSMOW (Vienna Standard Mean Ocean Water) and normalized on scales such that the oxygen and hydrogen isotopic values of SLAP (Standard Light Antarctic Precipitation) are -55.5 per mill and -428 per mill, respectively. The 2-sigma uncertainties of oxygen and hydrogen isotopic results are 0.2 per mill and 2 per mill, respectively, unless otherwise indicated.

For sulfur isotope ratio measurements, dissolved sulfate is converted to BaSO₄, which is analyzed by conversion to sulfur dioxide with an elemental analyzer and subsequent analysis with a continuous flow isotope ratio mass spectrometer. Samples are analyzed simultaneously with BaSO₄ isotopic reference materials. No correction for oxygen isotopic composition was made to reported data.

Sulfur isotope ratios are reported in per mill relative to Vienna Canyon Diablo Troilite (VCDT), defined by assigning a value of -0.3 per mill exactly to IAEA-S-1 silver sulfide (previously known as NZ-1).

Completeness

The electronic data deliverable was the only deliverable received for this RIN.

Electronic Data Deliverable File

The EDD files arrived on June 11, 2014.

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), 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. A duplicate sample was collected from location HMC-951. 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, 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. The duplicate results met the criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

Page 1 of 1

RIN: 14046116 Lab Code: GEN Project: Bluewater Validation Date: 08/15/2014

Duplicate: 2484

Sample: HMC-951

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Arsenic	8.50	U		5.00	8.50	U		5.00			ug/L
Bicarbonate alkalinity (CaCO3)	272			1.00	274			1.00	0.73		mg/L
Calcium	146000			1.00	147000			1.00	0.68		ug/L
Carbonate alkalinity (CaCO3)	0.725	U		1.00	0.725	U		1.00			mg/L
Chloride	60.9			20.00	60.3			20.00	0.99		mg/L
Magnesium	43800			1.00	44200			1.00	0.91		ug/L
Molybdenum	1.19			1.00	1.36			1.00	13.33		ug/L
NO2+NO3 as N	4.82			10.00	5.03			10.00	4.26		mg/L
Potassium	4850			1.00	5020			1.00	3.44		ug/L
Selenium	7.50	U		5.00	7.50	U		5.00			ug/L
Sodium	81600			1.00	82300			1.00	0.85		ug/L
Sulfate	378			20.00	377			20.00	0.26		mg/L
Total Dissolved Solids	901			1.00	909			1.00	0.88		mg/L
Tritium	6.36		4.51	1.00	8.59		2.50	1.00		0.8	pCi/L
Uranium	31.7			1.00	30.6			1.00	3.53		ug/L
Uranium-233+234	12.7		1.80	1.00	12.3		1.79	1.00	3.20	0.3	pCi/L
Uranium-235/236	0.460		0.211	1.00	0.585		0.252	1.00		0.7	pCi/L
Uranium-238	11.0		1.58	1.00	10.3		1.54	1.00	6.57	0.6	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 Donovan 9-24-2014
Stephen Donovan Date

Data Validation Lead: Stephen Donovan 9-24-2014
Stephen Donovan Date

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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.

There were no potential outliers identified, and the data for this event are acceptable as qualified.

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Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 01/01/2004

Laboratory: GEL Laboratories

RIN: 14046116

Report Date: 08/19/2014

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
BLU01	11(SG)	N001	04/29/2014	Chloride	207	H	FJ	193		F	177		F	5	0	No
BLU01	11(SG)	N001	04/29/2014	Sodium	357			326		F	235		F	5	0	No
BLU01	11(SG)	N001	04/29/2014	Sulfate	815	H	FJ	744		F	369		F	5	0	No
BLU01	15(SG)	N001	04/29/2014	Calcium	105			102		F	78.9		F	5	0	No
BLU01	15(SG)	N001	04/29/2014	Magnesium	38.2			35.3		F	27.9		F	5	0	No
BLU01	15(SG)	N001	04/29/2014	Sulfate	456	H	FJ	436		F	265		F	5	0	No
BLU01	21(M)	N001	04/29/2014	Nitrate + Nitrite as Nitrogen	12.1			12.0		F	7.90		F	9	0	No
BLU01	21(M)	N001	04/29/2014	Selenium	0.0121	B	F	0.0120		F	0.00900		F	9	0	No
BLU01	21(M)	N001	04/29/2014	Sulfate	521	H	FJ	520		F	467		F	9	0	No
BLU01	22(M)	N001	04/29/2014	Arsenic	0.00850	U	F	0.00380		F	0.00251	B	F	7	0	No
BLU01	22(M)	N001	04/29/2014	Chloride	31.2			44.0		F	31.8		F	7	0	No
BLU01	22(M)	N001	04/29/2014	Total Dissolved Solids	873			1100		F	896		F	7	0	No
BLU01	22(M)	N001	04/29/2014	Uranium	0.393			0.388		F	0.310		F	7	0	No
BLU01	E(M)	0001	04/30/2014	Alkalinity, Bicarbonate (as CaCO ₃)	27.7			16.2		FQ	0.725	U	FQ	5	1	No
BLU01	E(M)	0001	04/30/2014	Arsenic	0.00850	U	FQ	0.00170	U	FQ	0.000046	B	FQ	9	6	NA
BLU01	E(M)	0001	04/30/2014	Chloride	30.0			42.0		FQ	31.2		FQ	9	0	No
BLU01	F(M)	N001	04/30/2014	Alkalinity, Bicarbonate (as CaCO ₃)	163			180		F	164		F	6	0	No

Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 01/01/2004

Laboratory: GEL Laboratories

RIN: 14046116

Report Date: 08/19/2014

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
BLU01	I(SG)	N001	04/30/2014	Nitrate + Nitrite as Nitrogen	1.71			1.53		F	0.01000	U	F	15	9	NA
BLU01	L(SG)	N001	04/29/2014	Alkalinity, Bicarbonate (as CaCO ₃)	591		F	573		F	15.7		F	8	0	NA
BLU01	L(SG)	N001	04/29/2014	Sulfate	653	H	FJ	630		F	1.70		F	12	0	NA
BLU01	OBS-3	0001	04/29/2014	Arsenic	0.00850	U		0.00219	B	FQ	0.000061	B	F	10	6	NA
BLU01	S(SG)	N001	04/29/2014	Arsenic	0.00850	U		0.00170	U	FQ	0.000087	B	F	10	7	NA
BLU01	S(SG)	N001	04/29/2014	Calcium	276			897		F	283			10	0	NA
BLU01	S(SG)	N001	04/29/2014	Sulfate	1290	H	J	1260		FQ	295		F	10	0	NA
BLU01	Y2(M)	N001	04/30/2014	Arsenic	0.00850	U	F	0.00364	B	F	0.00120		F	12	6	NA
BLU01	Y2(M)	N001	04/30/2014	Calcium	55.0		F	77.0		F	56.5		F	12	0	NA
BLU01	Y2(M)	N001	04/30/2014	Nitrate + Nitrite as Nitrogen	1.81		F	1.66		F	0.494		F	14	0	No
BLU01	Y2(M)	N001	04/30/2014	Selenium	0.00750	U	F	0.00217	B	F	0.00064		F	12	3	No
BLU01	Y2(M)	N001	04/30/2014	Sodium	57.7		F	56.5		F	14.0		F	12	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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Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 11(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	265	-	295	468		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	265	-	295	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	265	-	295	516		F	#		
Arsenic	mg/L	04/29/2014	N001	265	-	295	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	265	-	295	176		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	265	-	295	207	H	FJ	#	3.35	
Dissolved Oxygen	mg/L	04/29/2014	N001	265	-	295	1.04		F	#		
Magnesium	mg/L	04/29/2014	N001	265	-	295	63.7		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	265	-	295	0.000744		UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	265	-	295	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	04/29/2014	N001	265	-	295	-160		F	#		
pH	s.u.	04/29/2014	N001	265	-	295	7.04		F	#		
Potassium	mg/L	04/29/2014	N001	265	-	295	10.6		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	265	-	295	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	265	-	295	357		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	265	-	295	2620		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	265	-	295	-80.01		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	265	-	295	-10.22		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 11(SG) WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	265 - 295	9.83		F	#		
Sulfate	mg/L	04/29/2014	N001	265 - 295	815	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	265 - 295	15.5		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	265 - 295	1860		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	265 - 295	3.71		FJ	#	2.45	1.72
Turbidity	NTU	04/29/2014	N001	265 - 295	2.12		F	#		
Uranium	mg/L	04/29/2014	N001	265 - 295	0.0157		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	265 - 295	8.2		F	#	0.211	1.29
Uranium-235	pCi/L	04/29/2014	N001	265 - 295	0.283		F	#	0.0707	0.176
Uranium-238	pCi/L	04/29/2014	N001	265 - 295	5.24		F	#	0.211	0.91

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 13(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	270	-	300	287		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	270	-	300	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	270	-	300	810		RF	#		
Arsenic	mg/L	04/29/2014	N001	270	-	300	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	270	-	300	172		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	270	-	300	90.2		F	#	1.34	
Dissolved Oxygen	mg/L	04/29/2014	N001	270	-	300	2.94		F	#		
Magnesium	mg/L	04/29/2014	N001	270	-	300	52.5		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	270	-	300	0.00143		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	270	-	300	5.2		F	#	0.17	
Oxidation Reduction Potential	mV	04/29/2014	N001	270	-	300	92		F	#		
pH	s.u.	04/29/2014	N001	270	-	300	7.01		F	#		
Potassium	mg/L	04/29/2014	N001	270	-	300	6.33		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	270	-	300	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	270	-	300	114		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	270	-	300	1470		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	270	-	300	-74.34		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	270	-	300	-9.26		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 13(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	-	BLS)		Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	270	-	300	5.86		F	#		
Sulfate	mg/L	04/29/2014	N001	270	-	300	459	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	270	-	300	12.7		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	270	-	300	1080		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	270	-	300	8.44		F	#	2.6	2.52
Turbidity	NTU	04/29/2014	N001	270	-	300	3.05		F	#		
Uranium	mg/L	04/29/2014	N001	270	-	300	0.108		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	270	-	300	34.5		F	#	0.262	4.43
Uranium-235	pCi/L	04/29/2014	N001	270	-	300	1.61		F	#	0.175	0.399
Uranium-238	pCi/L	04/29/2014	N001	270	-	300	33.2		F	#	0.113	4.28

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 14(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	N001	285	-	315	422		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	N001	285	-	315	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	N002	285	-	315	444		F	#		
Arsenic	mg/L	04/30/2014	N001	285	-	315	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/30/2014	N001	285	-	315	134		F	#	0.05	
Chloride	mg/L	04/30/2014	N001	285	-	315	160		F	#	1.34	
Dissolved Oxygen	mg/L	04/30/2014	N002	285	-	315	0.61		F	#		
Magnesium	mg/L	04/30/2014	N001	285	-	315	55.2		F	#	0.11	
Molybdenum	mg/L	04/30/2014	N001	285	-	315	0.00256		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	N001	285	-	315	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	04/30/2014	N002	285	-	315	-30		F	#		
pH	s.u.	04/30/2014	N002	285	-	315	7.11		F	#		
Potassium	mg/L	04/30/2014	N001	285	-	315	5		F	#	0.05	
Selenium	mg/L	04/30/2014	N001	285	-	315	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/30/2014	N001	285	-	315	256		F	#	0.1	
Specific Conductance	umhos/cm	04/30/2014	N002	285	-	315	1940		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0001	285	-	315	-79.51		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0001	285	-	315	-10.25		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 14(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0001	285	-	315	6.62		F	#		
Sulfate	mg/L	04/30/2014	N001	285	-	315	500		F	#	6.65	
Temperature	C	04/30/2014	N002	285	-	315	14.7		F	#		
Total Dissolved Solids	mg/L	04/30/2014	N001	285	-	315	1320		F	#	3.4	
Tritium	pCi/L	04/30/2014	N001	285	-	315	2.43	U	F	#	2.43	1.5
Turbidity	NTU	04/30/2014	N002	285	-	315	1.63		F	#		
Uranium	mg/L	04/30/2014	N001	285	-	315	0.0643		F	#	0.000067	
Uranium-234	pCi/L	04/30/2014	N001	285	-	315	21.1		F	#	0.264	2.89
Uranium-235	pCi/L	04/30/2014	N001	285	-	315	1.2		F	#	0.0679	0.362
Uranium-238	pCi/L	04/30/2014	N001	285	-	315	18.3		F	#	0.055	2.54

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 15(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	341	-	371	342		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	341	-	371	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	341	-	371	390		F	#		
Arsenic	mg/L	04/29/2014	N001	341	-	371	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	341	-	371	105		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	341	-	371	182		F	#	1.34	
Dissolved Oxygen	mg/L	04/29/2014	N001	341	-	371	0.82		F	#		
Magnesium	mg/L	04/29/2014	N001	341	-	371	38.2		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	341	-	371	0.00794		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	341	-	371	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	04/29/2014	N001	341	-	371	5		F	#		
pH	s.u.	04/29/2014	N001	341	-	371	7.23		F	#		
Potassium	mg/L	04/29/2014	N001	341	-	371	6.02		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	341	-	371	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	341	-	371	259		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	341	-	371	1860		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	341	-	371	-78.72		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	341	-	371	-10.06		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 15(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	341	-	371	3.23		F	#		
Sulfate	mg/L	04/29/2014	N001	341	-	371	456	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	341	-	371	14.4		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	341	-	371	1230		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	341	-	371	5.61		FJ	#	2.5	1.96
Turbidity	NTU	04/29/2014	N001	341	-	371	1.63		F	#		
Uranium	mg/L	04/29/2014	N001	341	-	371	0.129		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	341	-	371	49.9		F	#	0.217	6.55
Uranium-235	pCi/L	04/29/2014	N001	341	-	371	1.92		F	#	0.0728	0.491
Uranium-238	pCi/L	04/29/2014	N001	341	-	371	45		F	#	0.242	5.93

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 16(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	195	-	225	387		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	195	-	225	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	195	-	225	402		F	#		
Arsenic	mg/L	04/29/2014	N001	195	-	225	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	195	-	225	314		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	195	-	225	641	H	FJ	#	6.7	
Dissolved Oxygen	mg/L	04/29/2014	N001	195	-	225	0.98		F	#		
Magnesium	mg/L	04/29/2014	N001	195	-	225	158		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	195	-	225	0.00252		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	195	-	225	4.89		F	#	0.17	
Oxidation Reduction Potential	mV	04/29/2014	N001	195	-	225	10		F	#		
pH	s.u.	04/29/2014	N001	195	-	225	6.76		F	#		
Potassium	mg/L	04/29/2014	N001	195	-	225	12.9		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	195	-	225	0.0171	B	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	195	-	225	403		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	195	-	225	3840		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	195	-	225	-73.25		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	195	-	225	-9.08		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 16(SG) WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	195 - 225	0.3		F	#		
Sulfate	mg/L	04/29/2014	N001	195 - 225	1910	H	FJ	#	13.3	
Temperature	C	04/29/2014	N001	195 - 225	14.1		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	195 - 225	3100		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	195 - 225	6.56		FJ	#	2.36	2.06
Turbidity	NTU	04/29/2014	N001	195 - 225	2.98		F	#		
Uranium	mg/L	04/29/2014	N001	195 - 225	1.29		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	195 - 225	403		F	#	0.531	54.4
Uranium-235	pCi/L	04/29/2014	N001	195 - 225	19.9		F	#	0.296	3.18
Uranium-238	pCi/L	04/29/2014	N001	195 - 225	426		F	#	0.3	57.5

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 18(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	N001	260	-	290	324		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	N001	260	-	290	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	N002	260	-	290	344		F	#		
Arsenic	mg/L	04/30/2014	N001	260	-	290	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/30/2014	N001	260	-	290	168		F	#	0.05	
Chloride	mg/L	04/30/2014	N001	260	-	290	100		F	#	1.34	
Dissolved Oxygen	mg/L	04/30/2014	N002	260	-	290	0.77		F	#		
Magnesium	mg/L	04/30/2014	N001	260	-	290	50.9		F	#	0.11	
Molybdenum	mg/L	04/30/2014	N001	260	-	290	0.00383		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	N001	260	-	290	1.87		F	#	0.085	
Oxidation Reduction Potential	mV	04/30/2014	N002	260	-	290	90		F	#		
pH	s.u.	04/30/2014	N002	260	-	290	6.95		F	#		
Potassium	mg/L	04/30/2014	N001	260	-	290	7.12		F	#	0.05	
Selenium	mg/L	04/30/2014	N001	260	-	290	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/30/2014	N001	260	-	290	149		F	#	0.1	
Specific Conductance	umhos/cm	04/30/2014	N002	260	-	290	1610		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0001	260	-	290	-75.38		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0001	260	-	290	-9.5		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 18(SG) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0001	260	-	290	5.99	F	#		
Sulfate	mg/L	04/30/2014	N001	260	-	290	463	F	#	6.65	
Temperature	C	04/30/2014	N002	260	-	290	14.7	F	#		
Total Dissolved Solids	mg/L	04/30/2014	N001	260	-	290	1150	F	#	3.4	
Tritium	pCi/L	04/30/2014	N001	260	-	290	7.95	F	#	2.5	2.32
Turbidity	NTU	04/30/2014	N002	260	-	290	5.84	F	#		
Uranium	mg/L	04/30/2014	N001	260	-	290	0.134	F	#	0.00067	
Uranium-234	pCi/L	04/30/2014	N001	260	-	290	41.3	F	#	0.247	5.29
Uranium-235	pCi/L	04/30/2014	N001	260	-	290	1.78	F	#	0.0568	0.424
Uranium-238	pCi/L	04/30/2014	N001	260	-	290	41.8	F	#	0.169	5.35

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 20(M) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	110	-	125	234		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	110	-	125	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	110	-	125	280		F	#		
Arsenic	mg/L	04/29/2014	N001	110	-	125	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	110	-	125	143		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	110	-	125	59.6		F	#	1.34	
Dissolved Oxygen	mg/L	04/29/2014	N001	110	-	125	7.4		F	#		
Magnesium	mg/L	04/29/2014	N001	110	-	125	36.7		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	110	-	125	0.00208		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	110	-	125	3.93		F	#	0.17	
Oxidation Reduction Potential	mV	04/29/2014	N001	110	-	125	30		F	#		
pH	s.u.	04/29/2014	N001	110	-	125	7.4		F	#		
Potassium	mg/L	04/29/2014	N001	110	-	125	4.17		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	110	-	125	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	110	-	125	90.2		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	110	-	125	1280		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	110	-	125	-70.95		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	110	-	125	-8.69		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 20(M) WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	110 - 125	3.78		F	#		
Sulfate	mg/L	04/29/2014	N001	110 - 125	410	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	110 - 125	13.8		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	110 - 125	956		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	110 - 125	7.64		F	#	2.49	2.23
Turbidity	NTU	04/29/2014	N001	110 - 125	1.88		F	#		
Uranium	mg/L	04/29/2014	N001	110 - 125	0.0143		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	110 - 125	6.95		F	#	0.203	1.07
Uranium-235	pCi/L	04/29/2014	N001	110 - 125	0.318		FJ	#	0.207	0.187
Uranium-238	pCi/L	04/29/2014	N001	110 - 125	4.13		F	#	0.116	0.707

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 21(M) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	139.6	-	149.6	257		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	139.6	-	149.6	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	139.6	-	149.6	264		F	#		
Arsenic	mg/L	04/29/2014	N001	139.6	-	149.6	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	139.6	-	149.6	152		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	139.6	-	149.6	155		F	#	1.34	
Dissolved Oxygen	mg/L	04/29/2014	N001	139.6	-	149.6	4.77		F	#		
Magnesium	mg/L	04/29/2014	N001	139.6	-	149.6	41.1		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	139.6	-	149.6	0.000955		UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	139.6	-	149.6	12.1		F	#	0.425	
Oxidation Reduction Potential	mV	04/29/2014	N001	139.6	-	149.6	117		F	#		
pH	s.u.	04/29/2014	N001	139.6	-	149.6	7.29		F	#		
Potassium	mg/L	04/29/2014	N001	139.6	-	149.6	5.71		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	139.6	-	149.6	0.0121	B	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	139.6	-	149.6	213		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	139.6	-	149.6	1795		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	139.6	-	149.6	-71.67		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	139.6	-	149.6	-8.62		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 21(M) WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	139.6 - 149.6	1.62		F	#		
Sulfate	mg/L	04/29/2014	N001	139.6 - 149.6	521	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	139.6 - 149.6	13.6		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	139.6 - 149.6	1310		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	139.6 - 149.6	8		F	#	2.42	2.36
Turbidity	NTU	04/29/2014	N001	139.6 - 149.6	3.19		F	#		
Uranium	mg/L	04/29/2014	N001	139.6 - 149.6	0.137		F	#	0.00067	
Uranium-234	pCi/L	04/29/2014	N001	139.6 - 149.6	45.7		F	#	0.27	6
Uranium-235	pCi/L	04/29/2014	N001	139.6 - 149.6	2.09		F	#	0.256	0.52
Uranium-238	pCi/L	04/29/2014	N001	139.6 - 149.6	42.8		F	#	0.207	5.64

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 22(M) WELL

Parameter	Units	Sample		Depth Range		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)	Lab		Data	QA			
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	136.83	- 146.83	312		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	136.83	- 146.83	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	136.83	- 146.83	298		F	#		
Arsenic	mg/L	04/29/2014	N001	136.83	- 146.83	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	136.83	- 146.83	87		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	136.83	- 146.83	31.2		F	#	1.34	
Dissolved Oxygen	mg/L	04/29/2014	N001	136.83	- 146.83	2.67		F	#		
Magnesium	mg/L	04/29/2014	N001	136.83	- 146.83	24.9		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	136.83	- 146.83	0.000959		UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	136.83	- 146.83	36		F	#	0.85	
Oxidation Reduction Potential	mV	04/29/2014	N001	136.83	- 146.83	-5		F	#		
pH	s.u.	04/29/2014	N001	136.83	- 146.83	7.34		F	#		
Potassium	mg/L	04/29/2014	N001	136.83	- 146.83	4.53		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	136.83	- 146.83	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	136.83	- 146.83	169		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	136.83	- 146.83	1265		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	136.83	- 146.83	-68.33		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	136.83	- 146.83	-8.27		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 22(M) WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	136.83 - 146.83	8.93		F	#		
Sulfate	mg/L	04/29/2014	N001	136.83 - 146.83	225		F	#	2.66	
Temperature	C	04/29/2014	N001	136.83 - 146.83	14.1		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	136.83 - 146.83	873		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	136.83 - 146.83	10.4		F	#	2.65	2.77
Turbidity	NTU	04/29/2014	N001	136.83 - 146.83	8.01		F	#		
Uranium	mg/L	04/29/2014	N001	136.83 - 146.83	0.393		F	#	0.00067	
Uranium-234	pCi/L	04/29/2014	N001	136.83 - 146.83	117		F	#	0.215	14.8
Uranium-235	pCi/L	04/29/2014	N001	136.83 - 146.83	5.3		F	#	0.29	0.944
Uranium-238	pCi/L	04/29/2014	N001	136.83 - 146.83	115		F	#	0.193	14.5

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 23(M) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	0001	89	-	109	148		FQ	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	0001	89	-	109	0.725	U	FQ	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	0002	89	-	109	144		FQ	#		
Arsenic	mg/L	04/30/2014	0001	89	-	109	0.0085	U	FQ	#	0.0085	
Calcium	mg/L	04/30/2014	0001	89	-	109	124		FQ	#	0.05	
Chloride	mg/L	04/30/2014	0001	89	-	109	92		FQ	#	1.34	
Magnesium	mg/L	04/30/2014	0001	89	-	109	28.8		FQ	#	0.11	
Molybdenum	mg/L	04/30/2014	0001	89	-	109	0.00573		FQ	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	0001	89	-	109	1.78		FQ	#	0.085	
Oxidation Reduction Potential	mV	04/30/2014	N001	89	-	109	170		FQ	#		
pH	s.u.	04/30/2014	N001	89	-	109	7.73		FQ	#		
Potassium	mg/L	04/30/2014	0001	89	-	109	4.41		FQ	#	0.05	
Selenium	mg/L	04/30/2014	0001	89	-	109	0.0075	U	FQ	#	0.0075	
Sodium	mg/L	04/30/2014	0001	89	-	109	49.3		FQ	#	0.1	
Specific Conductance	umhos/cm	04/30/2014	N001	89	-	109	1030		FQ	#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0002	89	-	109	-79.11		FQ	#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0002	89	-	109	-10.25		FQ	#		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0002	89	-	109	6.6		FQ	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: 23(M) WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Sulfate	mg/L	04/30/2014	0001	89	-	109	274	FQ	#	2.66	
Temperature	C	04/30/2014	N001	89	-	109	12.7	FQ	#		
Total Dissolved Solids	mg/L	04/30/2014	0001	89	-	109	684	FQ	#	3.4	
Tritium	pCi/L	04/30/2014	0001	89	-	109	5.48	FQJ	#	2.42	1.93
Turbidity	NTU	04/30/2014	N001	89	-	109	298	FQ	#		
Uranium	mg/L	04/30/2014	0001	89	-	109	0.0262	FQ	#	0.000067	
Uranium-234	pCi/L	04/30/2014	0001	89	-	109	11	FQ	#	0.166	1.56
Uranium-235	pCi/L	04/30/2014	0001	89	-	109	0.446	FQ	#	0.142	0.2
Uranium-238	pCi/L	04/30/2014	0001	89	-	109	7.71	FQ	#	0.144	1.15

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	0001	68.6	-	89.8	27.7		FQ	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	0001	68.6	-	89.8	0.725	U	FQ	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	0002	68.6	-	89.8	30		FQ	#		
Arsenic	mg/L	04/30/2014	0001	68.6	-	89.8	0.0085	U	FQ	#	0.0085	
Calcium	mg/L	04/30/2014	0001	68.6	-	89.8	203		FQ	#	0.05	
Chloride	mg/L	04/30/2014	0001	68.6	-	89.8	30		FQ	#	1.34	
Dissolved Oxygen	mg/L	04/30/2014	N001	68.6	-	89.8	1.18		FQ	#		
Magnesium	mg/L	04/30/2014	0001	68.6	-	89.8	54.3		FQ	#	0.11	
Molybdenum	mg/L	04/30/2014	0001	68.6	-	89.8	0.000591		UFQ	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	0001	68.6	-	89.8	0.017	U	FQ	#	0.017	
Oxidation Reduction Potential	mV	04/30/2014	N001	68.6	-	89.8	-60		FQ	#		
pH	s.u.	04/30/2014	N001	68.6	-	89.8	7.45		FQ	#		
Potassium	mg/L	04/30/2014	0001	68.6	-	89.8	4.17		FQ	#	0.05	
Selenium	mg/L	04/30/2014	0001	68.6	-	89.8	0.0075	U	FQ	#	0.0075	
Sodium	mg/L	04/30/2014	0001	68.6	-	89.8	55.7		FQ	#	0.1	
Specific Conductance	umhos/cm	04/30/2014	N001	68.6	-	89.8	1370		FQ	#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0002	68.6	-	89.8	-78.95		FQ	#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0002	68.6	-	89.8	-10.02		FQ	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0002	68.6	-	89.8	15.41		FQ	#		
Sulfate	mg/L	04/30/2014	0001	68.6	-	89.8	795		FQ	#	13.3	
Temperature	C	04/30/2014	N001	68.6	-	89.8	14.2		FQ	#		
Total Dissolved Solids	mg/L	04/30/2014	0001	68.6	-	89.8	1150		FQ	#	3.4	
Tritium	pCi/L	04/30/2014	0001	68.6	-	89.8	5.76		UFQ	#	2.57	4.09
Turbidity	NTU	04/30/2014	N001	68.6	-	89.8	39.8		FQ	#		
Uranium	mg/L	04/30/2014	0001	68.6	-	89.8	0.000067	U	FQ	#	0.000067	
Uranium-234	pCi/L	04/30/2014	0001	68.6	-	89.8	0.237	U	FQ	#	0.237	0.139
Uranium-235	pCi/L	04/30/2014	0001	68.6	-	89.8	0.0793	U	FQ	#	0.0793	0.0898
Uranium-238	pCi/L	04/30/2014	0001	68.6	-	89.8	0.287	U	FQ	#	0.287	0.119

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID				Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	N001	94.2	- 114.87	163		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	N001	94.2	- 114.87	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	N002	94.2	- 114.87	172		F	#		
Arsenic	mg/L	04/30/2014	N001	94.2	- 114.87	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/30/2014	N001	94.2	- 114.87	69.8		F	#	0.05	
Chloride	mg/L	04/30/2014	N001	94.2	- 114.87	11.6		F	#	1.34	
Dissolved Oxygen	mg/L	04/30/2014	N002	94.2	- 114.87	2.59		F	#		
Magnesium	mg/L	04/30/2014	N001	94.2	- 114.87	18.9		F	#	0.11	
Molybdenum	mg/L	04/30/2014	N001	94.2	- 114.87	0.000985		UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	N001	94.2	- 114.87	0.737		F	#	0.017	
Oxidation Reduction Potential	mV	04/30/2014	N002	94.2	- 114.87	35		F	#		
pH	s.u.	04/30/2014	N002	94.2	- 114.87	7.73		F	#		
Potassium	mg/L	04/30/2014	N001	94.2	- 114.87	3.27		F	#	0.05	
Selenium	mg/L	04/30/2014	N001	94.2	- 114.87	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/30/2014	N001	94.2	- 114.87	20.8		F	#	0.1	
Specific Conductance	umhos /cm	04/30/2014	N002	94.2	- 114.87	535		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0001	94.2	- 114.87	-66.56		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0001	94.2	- 114.87	-8.55		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0001	94.2 - 114.87	10.16		F	#		
Sulfate	mg/L	04/30/2014	N001	94.2 - 114.87	109		F	#	2.66	
Temperature	C	04/30/2014	N002	94.2 - 114.87	15.1		F	#		
Total Dissolved Solids	mg/L	04/30/2014	N001	94.2 - 114.87	400		F	#	3.4	
Tritium	pCi/L	04/30/2014	N001	94.2 - 114.87	11.7		UF	#	2.6	7.76
Turbidity	NTU	04/30/2014	N002	94.2 - 114.87	3.4		F	#		
Uranium	mg/L	04/30/2014	N001	94.2 - 114.87	0.00782		F	#	0.000067	
Uranium-234	pCi/L	04/30/2014	N001	94.2 - 114.87	3.17		F	#	0.274	0.599
Uranium-235	pCi/L	04/30/2014	N001	94.2 - 114.87	0.325		FJ	#	0.183	0.184
Uranium-238	pCi/L	04/30/2014	N001	94.2 - 114.87	2.52		F	#	0.207	0.506

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: HMC-951 WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	0001	241	-	275	272			#	0.725	
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	0002	241	-	275	274			#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	0001	241	-	275	0.725	U		#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	0002	241	-	275	0.725	U		#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	0003	241	-	275	312			#		
Arsenic	mg/L	04/30/2014	0001	241	-	275	0.0085	U		#	0.0085	
Arsenic	mg/L	04/30/2014	0002	241	-	275	0.0085	U		#	0.0085	
Calcium	mg/L	04/30/2014	0001	241	-	275	146			#	0.05	
Calcium	mg/L	04/30/2014	0002	241	-	275	147			#	0.05	
Chloride	mg/L	04/30/2014	0001	241	-	275	60.9			#	1.34	
Chloride	mg/L	04/30/2014	0002	241	-	275	60.3			#	1.34	
Dissolved Oxygen	mg/L	04/30/2014	N001	241	-	275	4.27			#		
Magnesium	mg/L	04/30/2014	0001	241	-	275	43.8			#	0.11	
Magnesium	mg/L	04/30/2014	0002	241	-	275	44.2			#	0.11	
Molybdenum	mg/L	04/30/2014	0001	241	-	275	0.00119			#	0.000165	
Molybdenum	mg/L	04/30/2014	0002	241	-	275	0.00136			#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	0001	241	-	275	4.82			#	0.17	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	0002	241	-	275	5.03			#	0.17	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: HMC-951 WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Oxidation Reduction Potential	mV	04/30/2014	N001	241	-	275	90			#		
pH	s.u.	04/30/2014	N001	241	-	275	7.09			#		
Potassium	mg/L	04/30/2014	0001	241	-	275	4.85			#	0.05	
Potassium	mg/L	04/30/2014	0002	241	-	275	5.02			#	0.05	
Selenium	mg/L	04/30/2014	0001	241	-	275	0.0075	U		#	0.0075	
Selenium	mg/L	04/30/2014	0002	241	-	275	0.0075	U		#	0.0075	
Sodium	mg/L	04/30/2014	0001	241	-	275	81.6			#	0.1	
Sodium	mg/L	04/30/2014	0002	241	-	275	82.3			#	0.1	
Specific Conductance	umhos/cm	04/30/2014	N001	241	-	275	1265			#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0003	241	-	275	-74.05			#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0004	241	-	275	-74.39			#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0003	241	-	275	-9.22			#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0004	241	-	275	-9.28			#		
Stable isotope ratio S-34/S-32 in Sulfate	‰nd	04/30/2014	0003	241	-	275	7.34			#		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0004	241	-	275	7.26			#		
Sulfate	mg/L	04/30/2014	0001	241	-	275	378			#	2.66	
Sulfate	mg/L	04/30/2014	0002	241	-	275	377			#	2.66	
Temperature	C	04/30/2014	N001	241	-	275	13.8			#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: HMC-951 WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Total Dissolved Solids	mg/L	04/30/2014	0001	241	-	275	901			#	3.4	
Total Dissolved Solids	mg/L	04/30/2014	0002	241	-	275	909			#	3.4	
Tritium	pCi/L	04/30/2014	0001	241	-	275	6.36		U	#	2.69	4.51
Tritium	pCi/L	04/30/2014	0002	241	-	275	8.59			#	2.68	2.5
Turbidity	NTU	04/30/2014	N001	241	-	275	16.8			#		
Uranium	mg/L	04/30/2014	0001	241	-	275	0.0317			#	0.000067	
Uranium	mg/L	04/30/2014	0002	241	-	275	0.0306			#	0.000067	
Uranium-234	pCi/L	04/30/2014	0001	241	-	275	12.7			#	0.179	1.8
Uranium-234	pCi/L	04/30/2014	0002	241	-	275	12.3			#	0.139	1.79
Uranium-235	pCi/L	04/30/2014	0001	241	-	275	0.46			#	0.153	0.211
Uranium-235	pCi/L	04/30/2014	0002	241	-	275	0.585			#	0.172	0.252
Uranium-238	pCi/L	04/30/2014	0001	241	-	275	11			#	0.124	1.58
Uranium-238	pCi/L	04/30/2014	0002	241	-	275	10.3			#	0.175	1.54

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	N001	-	370			#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	N001	-	0.725	U		#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	N002	-	426			#		
Arsenic	mg/L	04/30/2014	N001	-	0.0085	U		#	0.0085	
Calcium	mg/L	04/30/2014	N001	-	263			#	0.05	
Chloride	mg/L	04/30/2014	N001	-	305			#	6.7	
Dissolved Oxygen	mg/L	04/30/2014	N002	-	0.86			#		
Magnesium	mg/L	04/30/2014	N001	-	99.8			#	0.11	
Molybdenum	mg/L	04/30/2014	N001	-	0.00103			#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	N001	-	1.71			#	0.085	
Oxidation Reduction Potential	mV	04/30/2014	N002	-	30			#		
pH	s.u.	04/30/2014	N002	-	6.75			#		
Potassium	mg/L	04/30/2014	N001	-	13			#	0.05	
Selenium	mg/L	04/30/2014	N001	-	0.00805	B		#	0.0075	
Sodium	mg/L	04/30/2014	N001	-	297			#	0.1	
Specific Conductance	umhos /cm	04/30/2014	N002	-	2870			#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0001	-	-77.71			#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0001	-	-9.81			#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0001	-	3.83			#		
Sulfate	mg/L	04/30/2014	N001	-	932			#	13.3	
Temperature	C	04/30/2014	N002	-	15.5			#		
Total Dissolved Solids	mg/L	04/30/2014	N001	-	2210			#	3.4	
Tritium	pCi/L	04/30/2014	N001	-	7.84		U	#	2.67	5.37
Turbidity	NTU	04/30/2014	N002	-	1.14			#		
Uranium	mg/L	04/30/2014	N001	-	0.288			#	0.000067	
Uranium-234	pCi/L	04/30/2014	N001	-	104			#	0.192	13
Uranium-235	pCi/L	04/30/2014	N001	-	5.55			#	0.185	0.939
Uranium-238	pCi/L	04/30/2014	N001	-	101			#	0.15	12.6

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	-	591		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	-	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	-	516		F	#		
Arsenic	mg/L	04/29/2014	N001	-	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	-	141		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	-	213	H	FJ	#	3.35	
Dissolved Oxygen	mg/L	04/29/2014	N001	-	1.01		F	#		
Magnesium	mg/L	04/29/2014	N001	-	77.4		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	-	0.000394	B	UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	-	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	04/29/2014	N001	-	-50		F	#		
pH	s.u.	04/29/2014	N001	-	6.87		F	#		
Potassium	mg/L	04/29/2014	N001	-	8.05		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	-	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	-	354		F	#	0.1	
Specific Conductance	umhos /cm	04/29/2014	N001	-	2505		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	-	-84.61		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	-	-11.06		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	-	9.53		F	#		
Sulfate	mg/L	04/29/2014	N001	-	653	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	-	14.5		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	-	1770		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	-	2.61	U	F	#	2.61	1.82
Turbidity	NTU	04/29/2014	N001	-	2.7		F	#		
Uranium	mg/L	04/29/2014	N001	-	0.00308		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	-	1.57		F	#	0.232	0.424
Uranium-235	pCi/L	04/29/2014	N001	-	0.0778	U	F	#	0.0778	0.102
Uranium-238	pCi/L	04/29/2014	N001	-	1.09		F	#	0.063	0.332

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	0001	152.4	-	350	35.2			#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	0001	152.4	-	350	0.725	U		#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	0001	152.4	-	350	54			#		
Arsenic	mg/L	04/29/2014	0001	152.4	-	350	0.0085	U		#	0.0085	
Calcium	mg/L	04/29/2014	0001	152.4	-	350	126			#	0.05	
Chloride	mg/L	04/29/2014	0001	152.4	-	350	689	H	J	#	6.7	
Dissolved Oxygen	mg/L	04/29/2014	N001	152.4	-	350	0.22			#		
Magnesium	mg/L	04/29/2014	0001	152.4	-	350	136			#	0.11	
Molybdenum	mg/L	04/29/2014	0001	152.4	-	350	0.000165	U		#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	0001	152.4	-	350	0.017	U		#	0.017	
Oxidation Reduction Potential	mV	04/29/2014	N001	152.4	-	350	-280			#		
pH	s.u.	04/29/2014	N001	152.4	-	350	7.55			#		
Potassium	mg/L	04/29/2014	0001	152.4	-	350	13.3			#	0.05	
Selenium	mg/L	04/29/2014	0001	152.4	-	350	0.0075	U		#	0.0075	
Sodium	mg/L	04/29/2014	0001	152.4	-	350	428			#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	152.4	-	350	3280			#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0002	152.4	-	350	-73.92			#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0002	152.4	-	350	-9.25			#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0002	152.4 - 350	8.61			#		
Sulfate	mg/L	04/29/2014	0001	152.4 - 350	920	H	J	#	13.3	
Temperature	C	04/29/2014	N001	152.4 - 350	15.6			#		
Total Dissolved Solids	mg/L	04/29/2014	0001	152.4 - 350	2360			#	3.4	
Tritium	pCi/L	04/29/2014	0001	152.4 - 350	10.3		U	#	2.71	6.91
Turbidity	NTU	04/29/2014	N001	152.4 - 350	34.2			#		
Uranium	mg/L	04/29/2014	0001	152.4 - 350	0.00771			#	0.000067	
Uranium-234	pCi/L	04/29/2014	0001	152.4 - 350	2.84			#	0.321	0.609
Uranium-235	pCi/L	04/29/2014	0001	152.4 - 350	0.235	U		#	0.235	0.168
Uranium-238	pCi/L	04/29/2014	0001	152.4 - 350	2.72			#	0.0596	0.572

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	BLS)			Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	159	-	280	362			#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	159	-	280	0.725	U		#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	159	-	280	438			#		
Arsenic	mg/L	04/29/2014	N001	159	-	280	0.0085	U		#	0.0085	
Calcium	mg/L	04/29/2014	N001	159	-	280	276			#	0.05	
Chloride	mg/L	04/29/2014	N001	159	-	280	523	H	J	#	6.7	
Dissolved Oxygen	mg/L	04/29/2014	N001	159	-	280	1.7			#		
Magnesium	mg/L	04/29/2014	N001	159	-	280	158			#	0.11	
Molybdenum	mg/L	04/29/2014	N001	159	-	280	0.00123			#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	159	-	280	2.77			#	0.17	
Oxidation Reduction Potential	mV	04/29/2014	N001	159	-	280	-130			#		
pH	s.u.	04/29/2014	N001	159	-	280	6.97			#		
Potassium	mg/L	04/29/2014	N001	159	-	280	13.2			#	0.05	
Selenium	mg/L	04/29/2014	N001	159	-	280	0.0122	B		#	0.0075	
Sodium	mg/L	04/29/2014	N001	159	-	280	404			#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	159	-	280	3870			#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	159	-	280	-73.27			#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	159	-	280	-9.15			#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	-	BLS)		Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	159	-	280	1.28			#		
Sulfate	mg/L	04/29/2014	N001	159	-	280	1290	H	J	#	13.3	
Temperature	C	04/29/2014	N001	159	-	280	15.5			#		
Total Dissolved Solids	mg/L	04/29/2014	N001	159	-	280	2980			#	3.4	
Tritium	pCi/L	04/29/2014	N001	159	-	280	8.67		U	#	2.59	5.93
Turbidity	NTU	04/29/2014	N001	159	-	280	4.67			#		
Uranium	mg/L	04/29/2014	N001	159	-	280	0.456			#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	159	-	280	154			#	0.221	20
Uranium-235	pCi/L	04/29/2014	N001	159	-	280	7.67			#	0.0855	1.34
Uranium-238	pCi/L	04/29/2014	N001	159	-	280	158			#	0.0692	20.5

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/29/2014	N001	123	-	132	204		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/29/2014	N001	123	-	132	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/29/2014	N001	123	-	132	230		F	#		
Arsenic	mg/L	04/29/2014	N001	123	-	132	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/29/2014	N001	123	-	132	153		F	#	0.05	
Chloride	mg/L	04/29/2014	N001	123	-	132	196	H	FJ	#	1.34	
Dissolved Oxygen	mg/L	04/29/2014	N001	123	-	132	3.87		F	#		
Magnesium	mg/L	04/29/2014	N001	123	-	132	44.3		F	#	0.11	
Molybdenum	mg/L	04/29/2014	N001	123	-	132	0.000747		UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/29/2014	N001	123	-	132	10.8		F	#	0.425	
Oxidation Reduction Potential	mV	04/29/2014	N001	123	-	132	30		F	#		
pH	s.u.	04/29/2014	N001	123	-	132	7.57		F	#		
Potassium	mg/L	04/29/2014	N001	123	-	132	5.23		F	#	0.05	
Selenium	mg/L	04/29/2014	N001	123	-	132	0.00786	B	F	#	0.0075	
Sodium	mg/L	04/29/2014	N001	123	-	132	187		F	#	0.1	
Specific Conductance	umhos/cm	04/29/2014	N001	123	-	132	1820		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/29/2014	0001	123	-	132	-74.11		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/29/2014	0001	123	-	132	-9.27		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

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

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/29/2014	0001	123	-	132	1.72		F	#		
Sulfate	mg/L	04/29/2014	N001	123	-	132	528	H	FJ	#	6.65	
Temperature	C	04/29/2014	N001	123	-	132	14.3		F	#		
Total Dissolved Solids	mg/L	04/29/2014	N001	123	-	132	1310		F	#	3.4	
Tritium	pCi/L	04/29/2014	N001	123	-	132	10		UF	#	2.65	6.74
Turbidity	NTU	04/29/2014	N001	123	-	132	8.68		F	#		
Uranium	mg/L	04/29/2014	N001	123	-	132	0.121		F	#	0.000067	
Uranium-234	pCi/L	04/29/2014	N001	123	-	132	44.1		F	#	0.455	5.95
Uranium-235	pCi/L	04/29/2014	N001	123	-	132	1.68		F	#	0.488	0.537
Uranium-238	pCi/L	04/29/2014	N001	123	-	132	40.1		F	#	0.441	5.44

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: Y2(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			Detection Limit	Uncertainty
								Lab	Data	QA		
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	04/30/2014	N001	98	-	123	199		F	#	0.725	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	04/30/2014	N001	98	-	123	0.725	U	F	#	0.725	
Alkalinity, Total (as CaCO ₃)	mg/L	04/30/2014	N002	98	-	123	212		F	#		
Arsenic	mg/L	04/30/2014	N001	98	-	123	0.0085	U	F	#	0.0085	
Calcium	mg/L	04/30/2014	N001	98	-	123	55		F	#	0.05	
Chloride	mg/L	04/30/2014	N001	98	-	123	16.4		F	#	1.34	
Dissolved Oxygen	mg/L	04/30/2014	N002	98	-	123	5.42		F	#		
Magnesium	mg/L	04/30/2014	N001	98	-	123	16.6		F	#	0.11	
Molybdenum	mg/L	04/30/2014	N001	98	-	123	0.0016		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	04/30/2014	N001	98	-	123	1.81		F	#	0.085	
Oxidation Reduction Potential	mV	04/30/2014	N002	98	-	123	55		F	#		
pH	s.u.	04/30/2014	N002	98	-	123	7.63		F	#		
Potassium	mg/L	04/30/2014	N001	98	-	123	3.09		F	#	0.05	
Selenium	mg/L	04/30/2014	N001	98	-	123	0.0075	U	F	#	0.0075	
Sodium	mg/L	04/30/2014	N001	98	-	123	57.7		F	#	0.1	
Specific Conductance	umhos/cm	04/30/2014	N002	98	-	123	620		F	#		
Stable isotope ratio H2/H1 in Water	‰	04/30/2014	0001	98	-	123	-76.4		F	#		
Stable isotope ratio O18/O16 in Water	‰	04/30/2014	0001	98	-	123	-9.88		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site

REPORT DATE: 08/19/2014

Location: Y2(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Stable isotope ratio S-34/S-32 in Sulfate	‰	04/30/2014	0001	98	-	123	9.85		F	#		
Sulfate	mg/L	04/30/2014	N001	98	-	123	104		F	#	2.66	
Temperature	C	04/30/2014	N002	98	-	123	13.9		F	#		
Total Dissolved Solids	mg/L	04/30/2014	N001	98	-	123	417		F	#	3.4	
Tritium	pCi/L	04/30/2014	N001	98	-	123	5.39		UF	#	2.52	3.86
Turbidity	NTU	04/30/2014	N002	98	-	123	1.82		F	#		
Uranium	mg/L	04/30/2014	N001	98	-	123	0.00513		F	#	0.000067	
Uranium-234	pCi/L	04/30/2014	N001	98	-	123	3.26		F	#	0.284	0.695
Uranium-235	pCi/L	04/30/2014	N001	98	-	123	0.274	U	F	#	0.274	0.125
Uranium-238	pCi/L	04/30/2014	N001	98	-	123	1.46		F	#	0.0693	0.41

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: 08/19/2014

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
11(SG)	O,C	6639.19	04/29/2014	15:15:38	207.01	6432.18
13(SG)	O,D	6593.57	04/29/2014	08:30:41	167.48	6426.09
14(SG)	O,C	6617.2	04/30/2014	15:30:50	189.41	6427.79
15(SG)	O,D	6612.53	04/29/2014	13:25:24	185.82	6426.71
16(SG)	O,D	6618.25	04/29/2014	10:35:58	186.25	6432
18(SG)	O,D	6601.32	04/30/2014	14:40:26	174.58	6426.74
20(M)	O,U	6613.38	04/29/2014	16:50:00	106.15	6507.23
21(M)	O,D	6593.8	04/29/2014	09:05:22	128.23	6465.57
22(M)	O,D	6606.48	04/29/2014	11:40:34	137.36	6469.12
23(M)	O,D	6579.22	04/30/2014	10:45:33	110.18	6469.04
E(M)	O,B	6616.32	04/30/2014	16:00:20	81.69	6534.63
F(M)	O,D	6603.59	04/30/2014	13:20:15	113.45	6490.14
HMC-951	F,D	6576.79	04/30/2014	10:10:29	152.29	6424.5
I(SG)	O,D	6625.93	04/30/2014	12:15:08	200.19	6425.74
L(SG)	O,B	6606.09	04/29/2014	16:15:00	165.28	6440.81
OBS-3	O,D	6617.22	04/29/2014	10:10:06	185.99	6431.23
S(SG)	O,D	6625.25	04/29/2014	14:00:51	193.2	6432.05
X(M)	O,D	6598.91	04/29/2014	12:30:23	132.15	6466.76
Y2(M)	O,D	6614.13	04/30/2014	14:05:30	117.34	6496.79

FLOW CODES:

B BACKGROUND
N UNKNOWN

C CROSS GRADIENT
O ONSITE

D DOWN GRADIENT
U UPGRADIENT

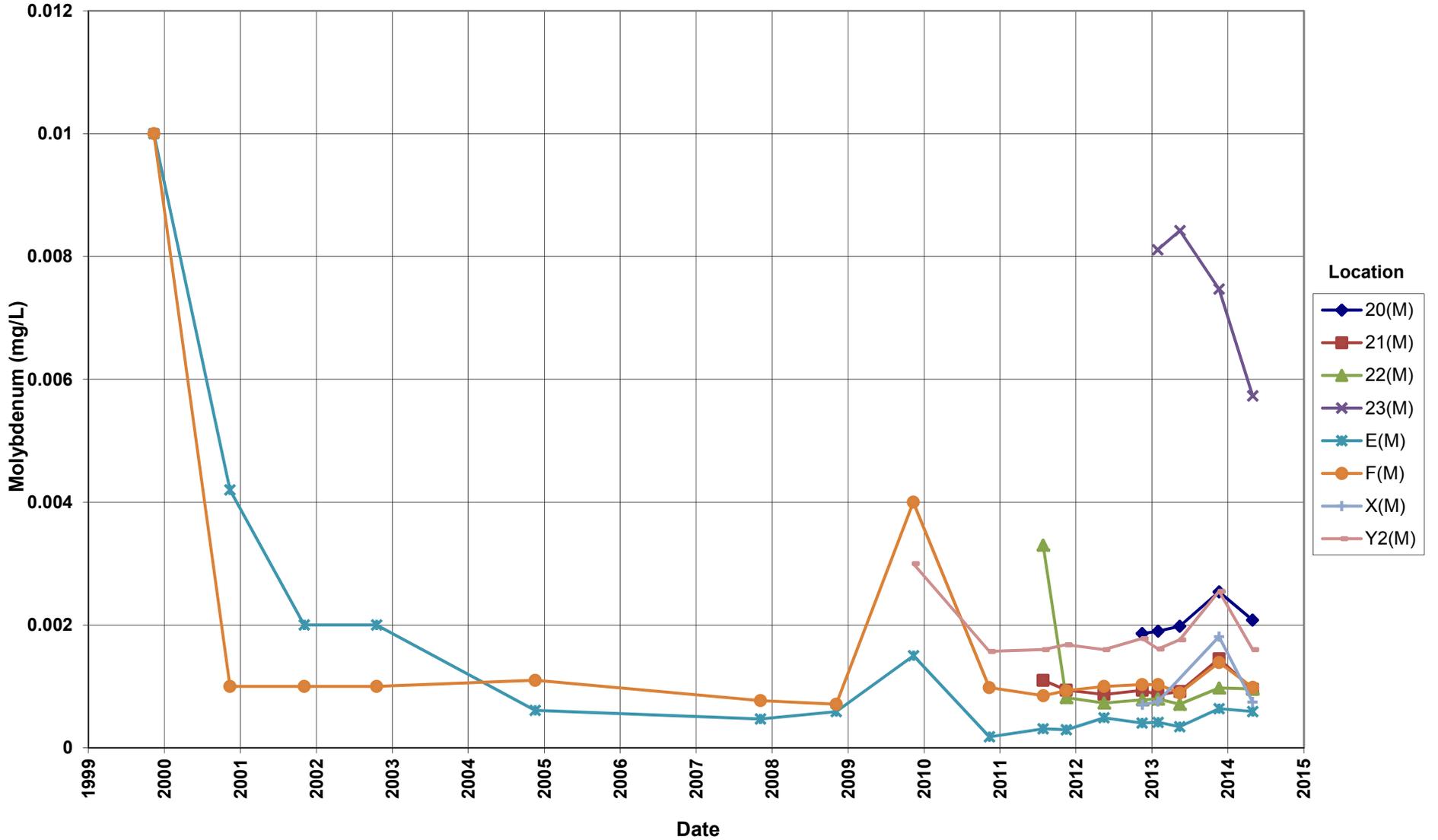
F OFFSITE

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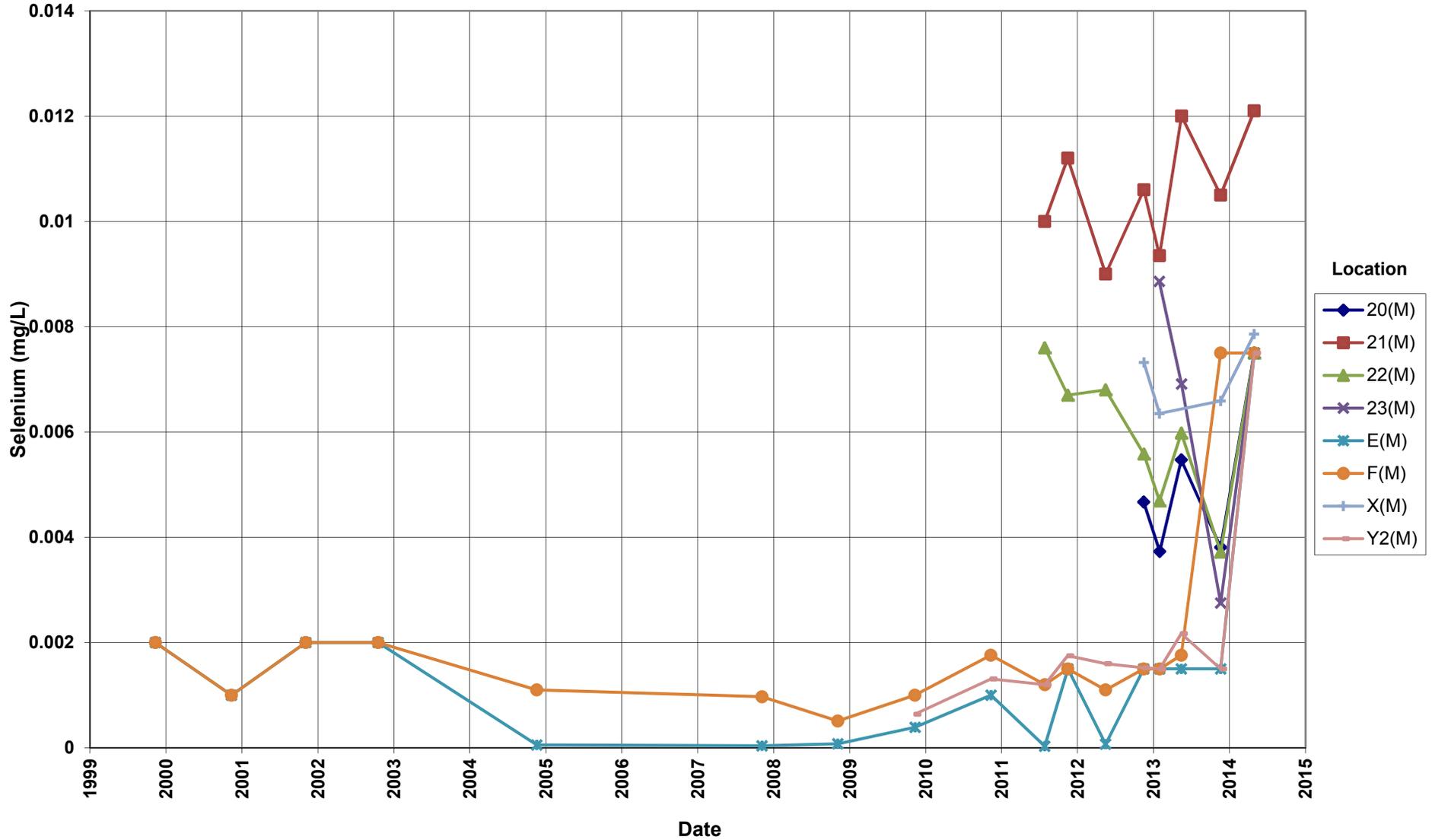
Time-Concentration Graphs

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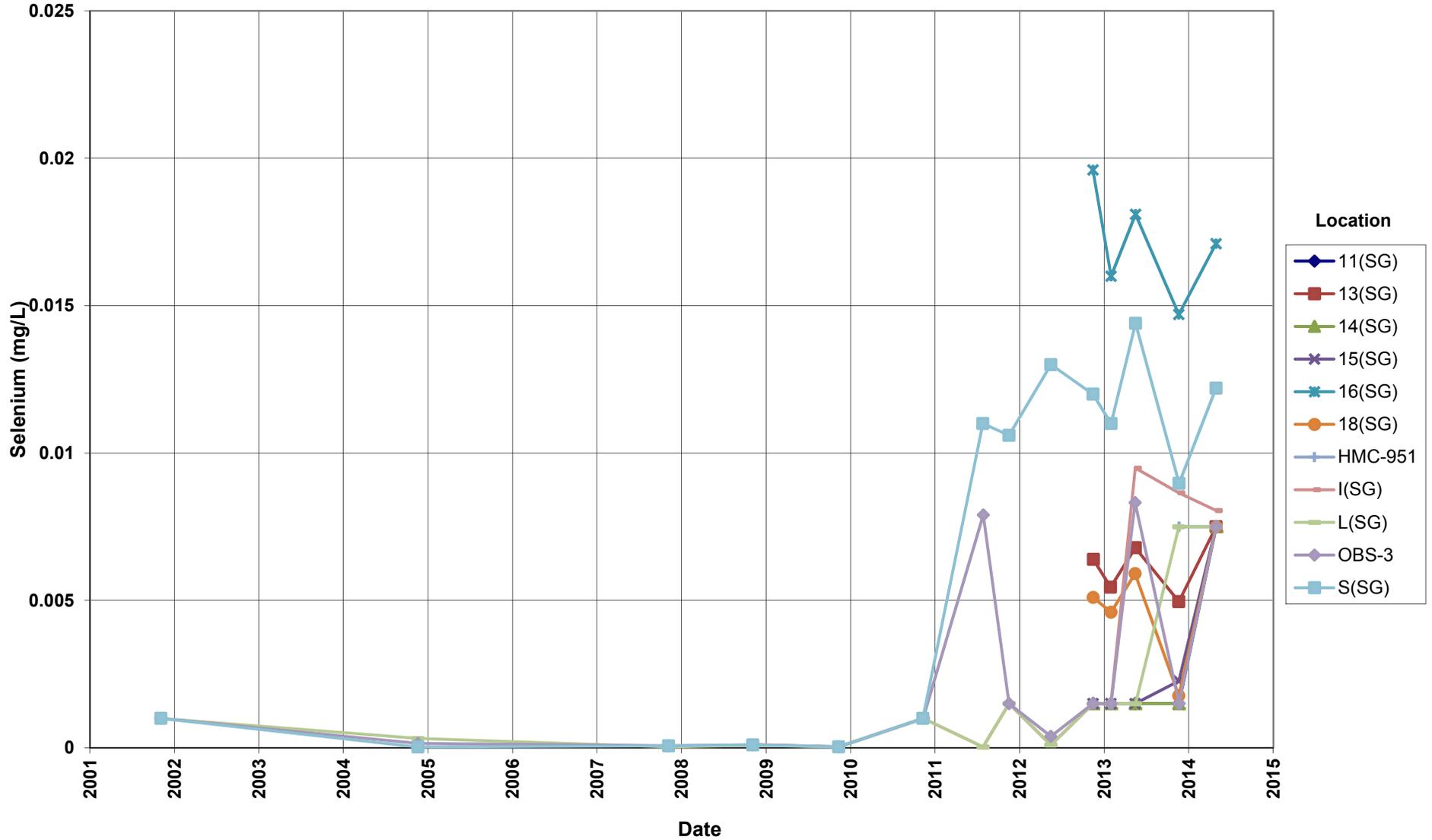
**Bluewater Disposal Site
Alluvium Wells
Molybdenum Concentration**
Alternate Concentration Limit (ACL) = 0.10 mg/L



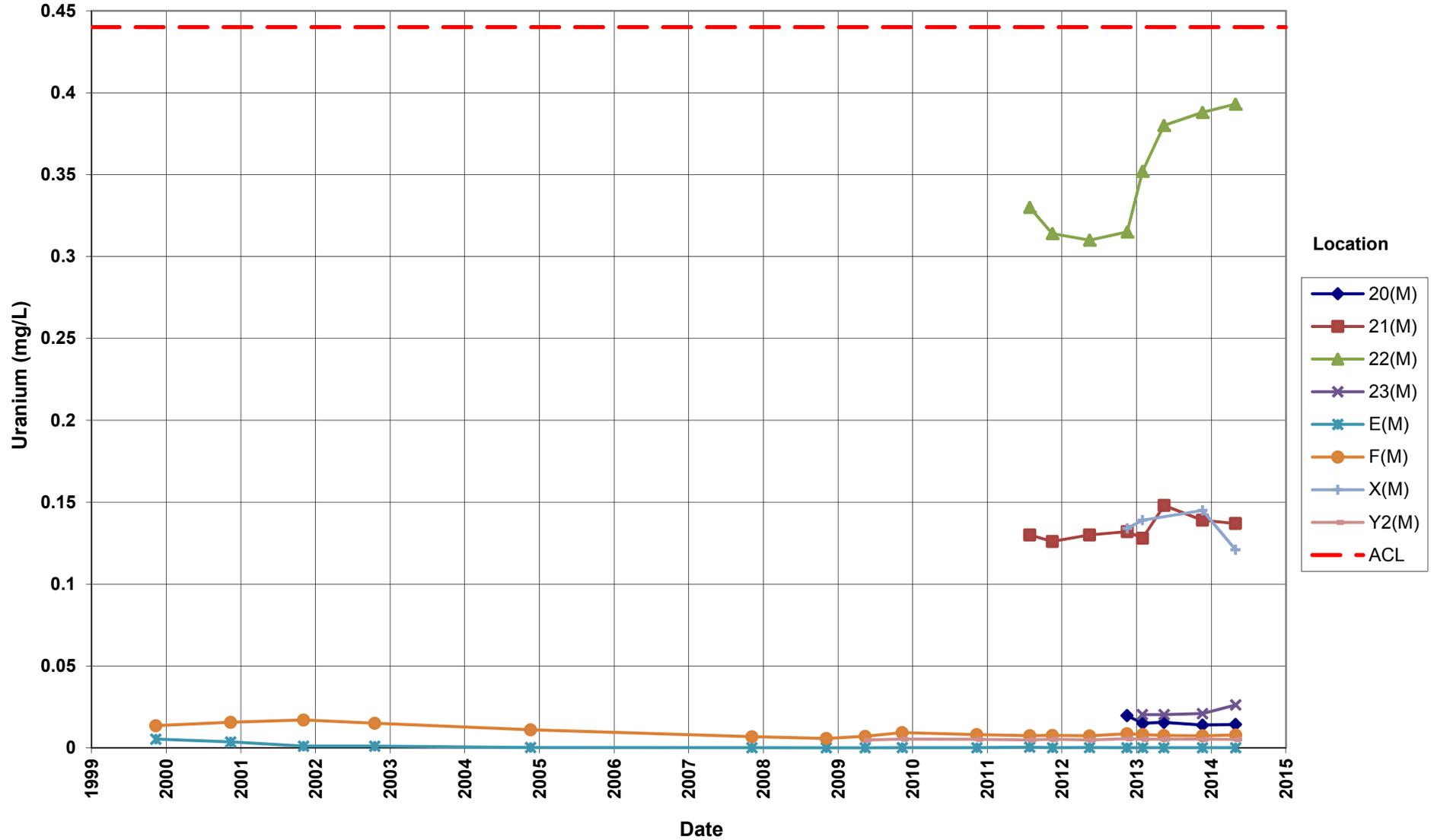
**Bluewater Disposal Site
Alluvium Wells
Selenium Concentration**
Alternate Concentration Limit (ACL) = 0.05 mg/L



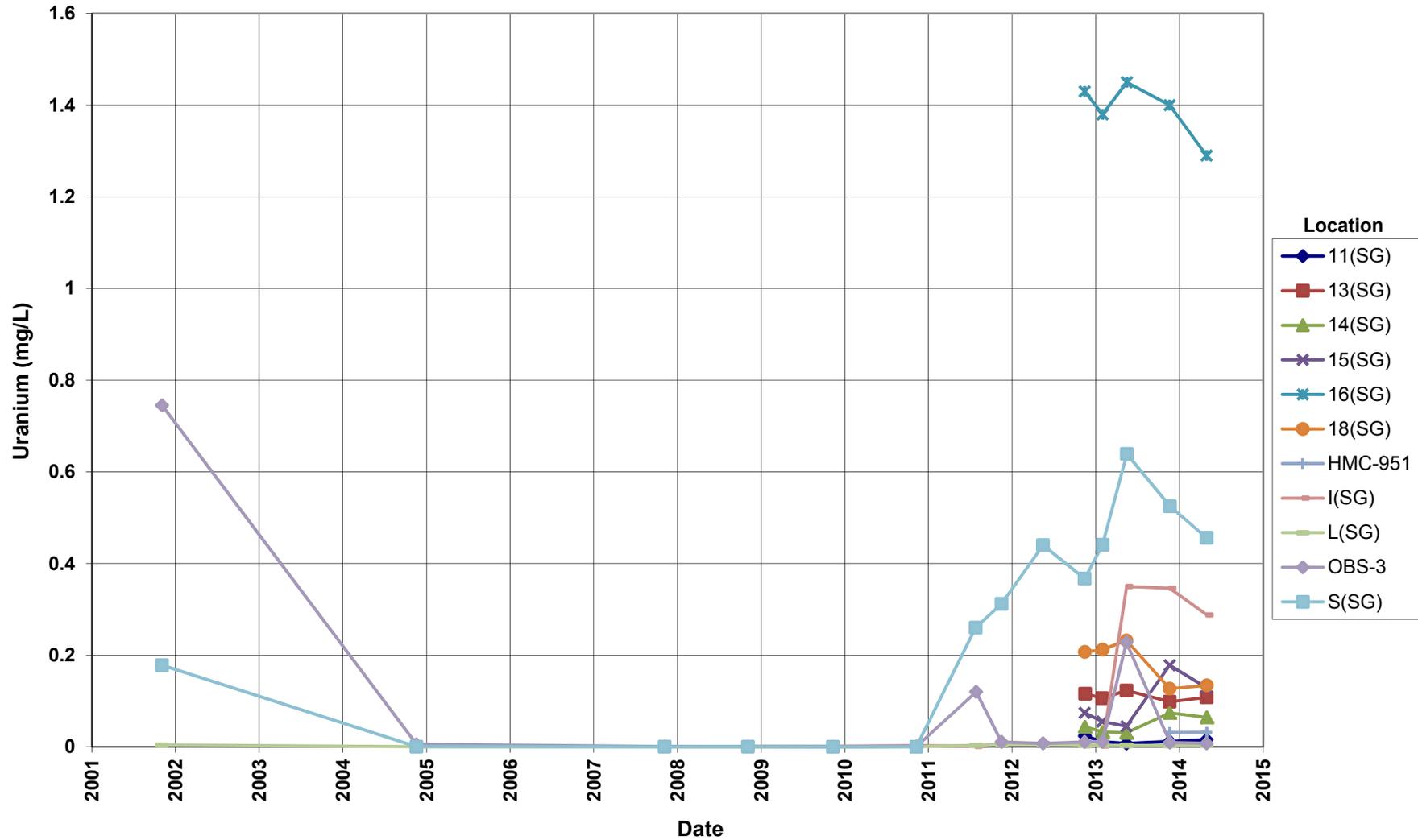
**Bluewater Disposal Site
Bedrock Wells
Selenium Concentration**
Alternate Concentration Limit (ACL) = 0.05 mg/L



**Bluewater Disposal Site
Alluvium Wells
Uranium Concentration**
Alternate Concentration Limit (ACL) = 0.44 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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April 17, 2014

Task Order LM-501
Control Number 14-0507

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, The S.M. Stoller Corporation, a wholly owned subsidiary of Huntington Ingalls Industries (Stoller)
May 2014 Environmental Sampling at 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 May 12, 2014.

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.

Deborah Barr
Control Number 14-0507
Page 2

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 Donovan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Richard Johnson, Stoller
EDD Delivery
rc-grand.junction
File: BLU 410.02(A)

A SUBSIDIARY OF HUNTINGTON INGALLS INDUSTRIES

2597 Legacy Way • Grand Junction, CO 81503-1789 • Telephone (970) 248-6000 • Fax (970) 248-6040

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.

Constituent Sampling Breakdown

Site	Bluewater		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	21	0			
<i>Field Measurements</i>					
Alkalinity	X				
Iron (filtered, ferrous)	X				
Dissolved Oxygen	X				
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
<i>Laboratory Measurements</i>					
Aluminum					
Ammonia as N (NH ₃ -N)					
Arsenic	X		0.0001	SW-846 6020	LMM-02
Bicarbonate	X		10	SM2320 B	WCH-A-003
Calcium	X		5	SW-846 6010	LMM-01
Carbonate	X		10	SM2320 B	WCH-A-004
Chloride	X		0.5	SW-846 9056	WCH-A-039
Deuterium	X		NA	Mass Spectrometry	LMW-08
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 (NO ₃ +NO ₂)-N	X		0.05	EPA 353.1	WCH-A-022
Oxygen-18	X		NA	Mass Spectrometry	LMW-08
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
Sulfur-34 (from SO ₄)	X		NA	Mass Spectrometry	LMW-09
Total Dissolved Solids	X		10	SM2540 C	WCH-A-033

Constituent Sampling Breakdown

Site	Bluewater		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Enriched Tritium	X		10 pCi/L	Liquid Scintillation	LMR-15
U-234, -238	X		1 pCi/L	Alpha Spectrometry	ASP-A-024
Uranium	X		0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	20	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.

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Attachment 4

Trip Report

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Memorandum

DATE: May 6, 2014
TO: Dick Johnson
FROM: Jeff Price
SUBJECT: Sampling Trip Report

Site: Bluewater, NM, Site

Dates of Sampling Event: April 28 – May 1, 2014

Team Members: David Atkinson and Jeff Price

Number of Locations Sampled: Samples were collected at 19 of the 20 monitoring well locations identified on the sampling notification letter.

Locations Not Sampled/Reason: Location T(M) was dry.

Location Specific Information:

LOCATION	COMMENTS
I(SG)	Need to install 0.4 liter bladder pump.
F(M)	Need to install 0.4 liter bladder pump.

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
2484	HMC 951	Duplicate	Groundwater	MFZ 224 (GEL Lab)
2604	HMC 951	Duplicate	Groundwater	MFZ 247 (Reston Lab)

RIN Number Assigned: Samples were assigned to RIN 14046116 (GEL Labs) and 14046117 (Reston Stable Isotopes).

Sample Shipment: Samples were shipped overnight via FedEx to GEL labs and Reston Stable Isotopes Lab, from Farmington, NM, on May 1, 2014.

Water Level Measurements: Water levels were measured at all wells prior to the start of sampling.

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), 23(M), OBS-3, HMC 951	Turbidity not met, samples were filtered.

Equipment: All equipment functioned properly.

Institutional Controls:

Fences, Gates, Locks: All ok.

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
Steve Donovan, Stoller
Dick Johnson, Stoller
EDD Delivery