

Data Validation Package

July 2011
Groundwater Sampling at the
Bluewater, New Mexico, Disposal Site

December 2011



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Bluewater, New Mexico, Disposal Site

Sampling Period: July 25–28, 2011

Groundwater samples were collected from ten 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). Included in the sampling were two new wells, 21(M) and 22(M), that had been installed and developed at the Bluewater site. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). One duplicate sample was collected from monitoring well Y2(M).

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

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

Analytical results for the required constituents for the alluvium wells are provided in Table 1. Alluvium point-of-exposure (POE) well X(M) could not be sampled because it was dry. The U.S. Nuclear Regulatory Commission (NRC)-approved alternate concentration limit (ACL) for uranium continues to be exceeded in point-of-compliance (POC) well T(M). The current concentration of 0.53 milligrams per liter (mg/L) is greater than the ACL of 0.44 mg/L. The uranium concentration in well T(M) has indicated an upward trend since DOE began sampling in 1998; the reason for this trend has not been determined. The U.S. Department of Energy has notified NRC of the exceedance and submitted an evaluative monitoring work plan (EMWP) to NRC on August 31, 2011, in accordance with the LTSP.

Table 1. July 2011 Groundwater Monitoring Analytical Results for the Alluvium Wells

Constituent	ACL	Alluvium Wells					
		E(M) (Bkgd)	F(M) (POC)	T(M) (POC)	Y2(M) (PCBs)	21(M) (Dwngrd)	22(M) (Dwngrd)
Molybdenum (mg/L)	0.10	0.0003	0.0009	0.024	0.0016	0.0011	0.0033
Selenium (mg/L)	0.05	ND	0.0012	0.0026	0.0012	0.010	0.0076
Uranium (mg/L)	0.44	0.0004	0.0074	0.53	0.0048	0.13	0.33

Key: ACL = alternate concentration limit; Bkgd = background well; Dwngrd = downgradient well; mg/L = milligrams per liter; ND = not detected; POC = point-of-compliance well; PCB = polychlorinated biphenyls monitoring well

Alluvium wells 21(M) and 22(M) were installed downgradient of well T(M) in July 2011; well 21(M) is located near the site boundary where alluvial groundwater leaves the site. The uranium concentration in well 21(M) was 0.13 mg/L, which exceeds the Uranium Mill Tailings Radiation Control Act maximum concentration limit (MCL) of 0.044 mg/L (40 CFR 192, Table 1). The investigation of this occurrence will be addressed in an addendum or revision to the EMWP. No other MCLs were exceeded at well 21(M), although the selenium concentration in this well equaled the MCL of 0.01 mg/L.


Analytical results for the required constituents for the bedrock wells are provided in Table 2. The selenium and uranium concentrations did not exceed NRC-approved ACLs in the POC wells, and no constituents exceeded their respective MCLs at the POE well.

Table 2. July 2011 Groundwater Monitoring Analytical Results for the Bedrock Wells

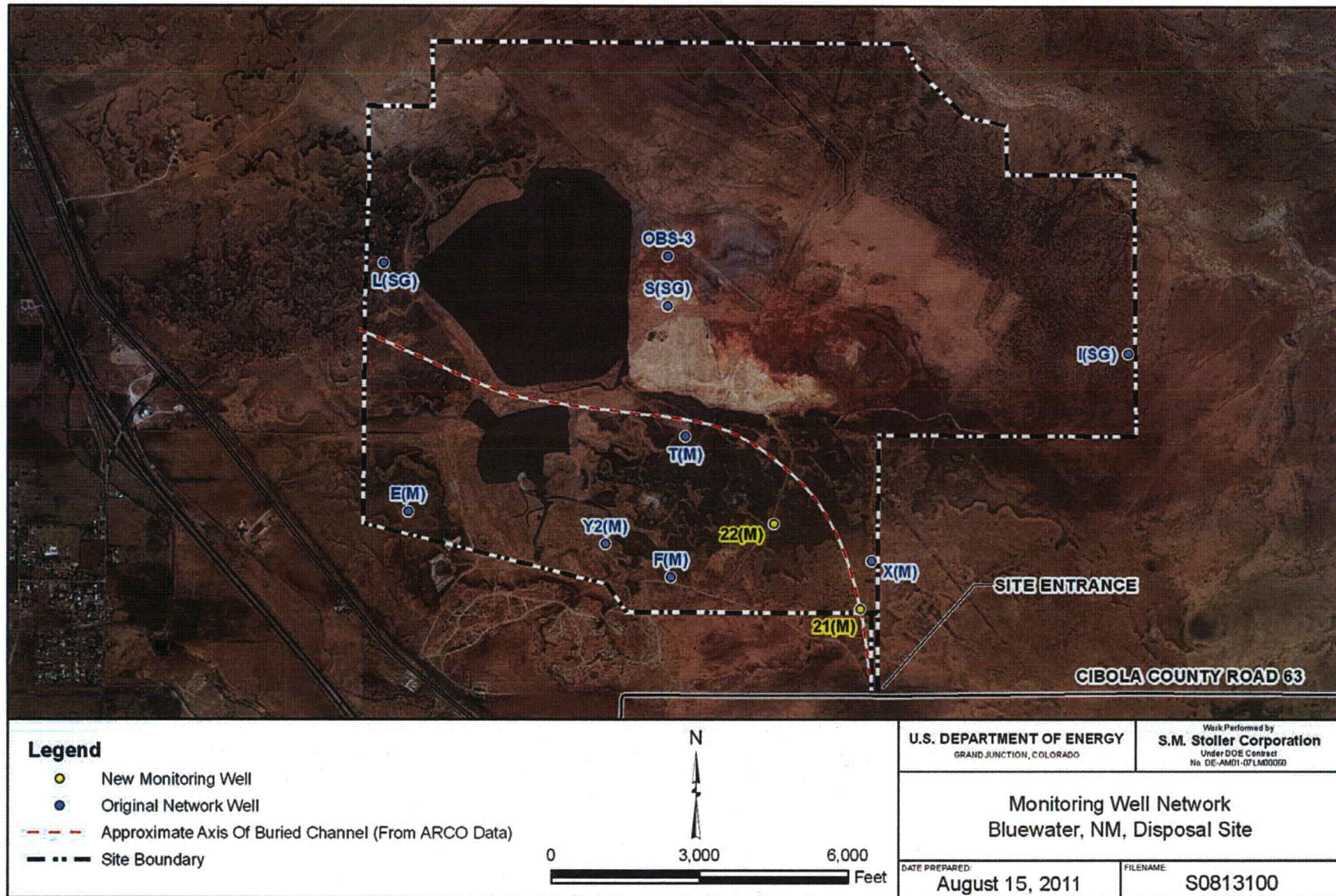
Constituent	ACL	Bedrock Wells			
		L(SG) (Bkgd)	OBS-3 (POC)	S(SG) (POC)	I(SG) (POE)
Selenium (mg/L)	0.05	ND	0.0079	0.011	ND
Uranium (mg/L)	2.15	0.0032	0.12	0.26	0.0011

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

In a letter to DOE dated June 29, 2010, NMED questioned the representativeness of analytical results for samples collected using the low-flow method, particularly for the bedrock POC wells. Subsequently in the spring of 2010, DOE investigated the conditions of all of the site wells using a down-hole video camera, and it was found that the slotted screen intervals in bedrock POC wells OBS-3 and S(SG) were encrusted with rust and scale. The casings were scrubbed with a wire brush, but the slots remained nearly sealed. To obtain a representative aquifer sample, the well casings were purged three times prior to sampling instead of using the normal low-flow sampling method (it was determined that the low-flow method was sampling essentially stagnant water in these two wells). Consequently, uranium concentrations in these wells were higher than previous sampling events that used the low-flow method (which started in 2004), but remain substantially below the ACL.


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

1/23/12
 Date



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Sample Location Map, Bluewater, New Mexico, Disposal Site

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	<u>Bluewater, New Mexico</u>	Date(s) of Water Sampling	<u>July 25–28, 2011</u>
Date(s) of Verification	<u>December 9, 2011</u>	Name of Verifier	<u>Steve Donovan</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	Yes	 Work Order letter dated May 16, 2011.
2. Were the sampling locations specified in the planning documents sampled?	No	Monitoring well X(M) was not sampled because it was dry. New wells 21(M) and 22(M) were sampled during this event.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on July 22, 2011.
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?	No	Dissolved oxygen was not measured.
6. Was the category of the well documented?	Yes	
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 stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	Yes Yes Yes Yes NA	

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 from location Y2(M).
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	An equipment blank was not required because all sampling equipment is dedicated.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location ID 2074 was used for the duplicate sample.
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	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. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	No	Water levels were obtained in all sampled wells except for S(SG) which was overlooked.

Laboratory Performance Assessment

General Information

Report Number (RIN): 11073944
Sample Event: July 26–28, 2011
Site(s): Bluewater, New Mexico
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1107399
Analysis: Metals, Organics, Radiochemistry, and Wet Chemistry
Validator: Steve Donovan
Review Date: October 21, 2011

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/S04325, continually updated) "Standard Practice for Validation of Laboratory 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	EPA 310.1
Alkalinity, Carbonate	WCH-A-004	EPA 310.1	EPA 310.1
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Calcium, Magnesium, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Arsenic, Molybdenum, Selenium, Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids	WCH-A-033	EPA 160.1	EPA 160.1
Tritium	LSC-A-001	SOP 700R12	SOP 704R10
Uranium Isotopes	ASP-A-024	SOP 776R12, 778R13	SOP 714R12

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
1107399-1	Y2(M) Duplicate	Nitrate + Nitrite as N	J	Matrix spike failure
1107399-1	Y2(M) Duplicate	Uranium-235	U	Less than the Decision Level Concentration
1107399-4	E(M)	Uranium-234	U	Less than the Decision Level Concentration
1107399-7	L(SG)	Uranium-235	J	Less than the Determination Limit
1107399-10	T(M)	Uranium-234	J	Low chemical recovery
1107399-10	T(M)	Uranium-235	J	Low chemical recovery
1107399-10	T(M)	Uranium-238	J	Low chemical recovery
1107399-11	Y2(M)	Uranium-235	J	Less than the Determination Limit

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 11 water samples on July 29, 2011, accompanied by a Chain of Custody form. The air waybill 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 3 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all metal, organic, and wet chemical analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99% 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 five 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% 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 three 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, with the following exception. The carbonate alkalinity MDL was 20 mg/L, which is above the requested MDL of 10 mg/L.

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 160.1, 310.1

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

Method EPA 353.2

Calibrations for nitrate + nitrite as N were performed using five calibration standards on August 9, 2011. 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 resulting in seven verification checks. All calibration check results were within the acceptance criteria.

Method SW-846 6010B

Calibrations for calcium, magnesium, potassium, and sodium were performed on August 17, 2011, using six calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the calibration curve intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 13 verification checks. 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 August 17, 2011, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the calibration curve intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in five verification checks. 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. Mass calibration and resolution verifications were performed at the beginning of each analytical run in

accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 9056

Calibrations for chloride and sulfate were performed using seven calibration standards on June 15, 2011. 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 resulting in 11 verification checks. All calibration checks met the acceptance criteria with the following exception. One chloride and sulfate calibration check analyzed on August 11, 2011, did not meet the acceptance criteria. None of the samples associated with this event were bracketed by this calibration check.

Uranium Isotopes

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. The required daily instrument operational checks were performed on December 6, 2010, meeting the acceptance criteria. The tracer recoveries met the acceptance criteria of 30 to 110 percent for all samples with the exception of sample T(M). The T(M) uranium isotope results are qualified with a "J" flag as estimated values. The full width at half maximum was reviewed to evaluate the spectral resolution. All internal standard full width at half maximum values were below 100 kiloelectron volts, demonstrating acceptable resolution. All internal standard peaks were within 50 kiloelectron volts of the expected position. The regions of interest (ROIs) for analyte peak integration were reviewed. No manual integrations were performed and all ROIs were satisfactory.

Tritium

The tritium quench calibration curve was generated on September 6, 2010, for quench indicator values ranging from 136 to 253. Daily instrument checks performed on December 9, 2010, met the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Methods without sample preparation do not require the analysis of a method blank. 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 associated with the samples were below the PQLs with the following exceptions. Some blank results for sodium were above the PQL. The samples associated with these blanks had sodium concentrations greater than 10 times the blank. Some other metals blanks exceeded the method detection limit but all associated sample results were greater than 5 times the blank concentrations.

Radiochemistry

The method blank results were less than the Decision Level Concentration.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interference 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 concentration. The spikes met the recovery and precision criteria for all analytes evaluated. At 112 percent, the MS recovery of chloride exceeded the laboratory's acceptance criteria, but was within the ± 25 percent requirement for methods for which no digestion is employed.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference 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 the PQL, the range should be no greater than the PQL. The replicate results met these criteria, demonstrating acceptable laboratory precision. The relative error ratio for radiochemical replicate results (calculated using the one-sigma total propagated uncertainty) was less than three, indicating 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 PQL for method 6010 or greater than 100 times the PQL for method 6020. 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.

Electronic Data Deliverable (EDD) File

The EDD file arrived on August 27, 2011. 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.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 11073944 Lab Code: PAR Validator: Steve Donovan Validation Date: 10/21/2011

Project: Bluewater Analysis Type: ☒ Metals ☒ General Chem ☒ Rad ☒ Organics

of Samples: 11 Matrix: WATER Requested Analysis Completed: Yes

Chain of Custody

Present: OK Signed: OK Dated: OK

Sample

Integrity: OK Preservation: OK Temperature: OK

Select Quality Parameters

☒ Holding Times

All analyses were completed within the applicable holding times.

☒ Detection Limits

There are 9 detection limit failures.

☐ Field/Trip Blanks

☒ Field Duplicates

There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

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RIN: 11073944

Lab Code: PAR

Non-Compliance Report: Detection Limits

Project: Bluewater

Validation Date: 10/21/2011

Ticket	Location	Lab Sample ID	Method Code	Lab Method	Analyte Name	Result	Qualifier	Reported Detection Limit	Required Detection Limit	Units
JIV 568	2074	1107399-1	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIX 317	21(M)	1107399-2	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIX 318	22(M)	1107399-3	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIV 563	F(M)	1107399-5	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIV 566	L(SG)	1107399-7	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIV 564	OBS-3	1107399-8	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIV 567	S(SG)	1107399-9	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIV 561	T(M)	1107399-10	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL
JIV 562	Y2(M)	1107399-11	WCH-A-004	EPA310.1	Alkalinity, Carbonate (CO3) as CaCO3		U	20	10	MGL

SAMPLE MANAGEMENT SYSTEM

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Metals Data Validation Worksheet

RIN: 11073944

Lab Code: PAR

Date Due: 8/26/2011

Matrix: Water

Site Code: BLU

Date Completed: 8/29/2011

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	ICV	CCV	ICB	CCB								
Arsenic	ICP/MS	08/17/2011			OK	OK	OK	OK	OK	109.0	104.0	107.0	2.0	108.0	7.0	110.0
Calcium	ICP/ES	08/17/2011			OK	OK	OK	OK	OK	98.0	97.0	96.0	0.0	106.0	1.0	105.0
Magnesium	ICP/ES	08/17/2011			OK	OK	OK	OK	OK	100.0	99.0	98.0	1.0	110.0	1.0	104.0
Molybdenum	ICP/MS	08/17/2011			OK	OK	OK	OK	OK	101.0	100.0	102.0	1.0	102.0		88.0
Potassium	ICP/ES	08/17/2011			OK	OK	OK	OK	OK	95.0	107.0	106.0	1.0			78.0
Selenium	ICP/MS	08/17/2011			OK	OK	OK	OK	OK	106.0	105.0	105.0	0.0	105.0		109.0
Sodium	ICP/ES	08/17/2011			OK	OK	OK	OK	OK	94.0	99.0	97.0	1.0		9.0	85.0
Uranium	ICP/MS	08/17/2011			OK	OK	OK	OK	OK	102.0	105.0	97.0	5.0	105.0	2.0	100.0

SAMPLE MANAGEMENT SYSTEM

Radiochemistry Data Validation Worksheet

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RIN: 11073944

Lab Code: PAR

Date Due: 8/26/2011

Matrix: Water

Site Code: BLU

Date Completed: 8/29/2011

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
2074	H-3	08/21/2011						0.14
Blank_Spike	H-3	08/22/2011				103.00		
T(M)	H-3	08/22/2011					108.0	
Blank	H-3	08/22/2011	95.6000	U				
2074	Uranium-233+234	08/10/2011			82.0			
21(M)	Uranium-233+234	08/10/2011			65.6			
22(M)	Uranium-233+234	08/10/2011			32.7			
E(M)	Uranium-233+234	08/10/2011			80.8			
I(SG)	Uranium-233+234	08/10/2011			81.2			
L(SG)	Uranium-233+234	08/10/2011			76.2			
OBS-3	Uranium-233+234	08/10/2011			70.7			
S(SG)	Uranium-233+234	08/10/2011			43.8			
T(M)	Uranium-233+234	08/10/2011			22.2			
Y2(M)	Uranium-233+234	08/10/2011			81.0			
Blank_Spike	Uranium-233+234	08/10/2011			82.3	96.30		
Blank_Spike_Du	Uranium-233+234	08/10/2011			85.8	91.90		0.40
Blank	Uranium-233+234	08/10/2011	-0.0060		72.2			
F(M)	Uranium-233+234	08/11/2011			87.7			
Blank	Uranium-235	08/10/2011	-0.0050					
Blank_Spike	Uranium-238	08/10/2011				96.20		
Blank_Spike_Du	Uranium-238	08/10/2011				94.80		0.10
Blank	Uranium-238	08/10/2011	-0.0004					

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 11073944

Lab Code: PAR

Date Due: 8/26/2011

Matrix: Water

Site Code: BLU

Date Completed: 8/29/2011

Analyte	Date Analyzed	CALIBRATION						Method	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
Alkalinity, Carbonate (CO3) as	08/10/2011							OK					
ALKALINITY, Total as CaCO3	08/08/2011							OK	99.00				
ALKALINITY, Total as CaCO3	08/10/2011							OK	99.00				
Bicarbonate	08/10/2011							OK				1.00	
CHLORIDE	08/02/2011	0.000	1.0000	OK	OK	OK	OK	OK	100.00	95.0			
CHLORIDE	08/03/2011			OK	OK	OK	OK				88.0	3.00	
Nitrate+Nitrite as N	08/09/2011	0.000	0.9998	OK	OK	OK	OK	OK	96.00	130.0	126.0	1.00	
SULFATE	08/02/2011	0.000	1.0000	OK	OK	OK	OK	OK	99.00	103.0			
SULFATE	08/03/2011			OK	OK	OK	OK				93.0	3.00	
TOTAL DISSOLVED SOLIDS	08/02/2011							OK	102.00			0	
TOTAL DISSOLVED SOLIDS	08/03/2011							OK	98.00			-0	

Sampling Quality Control Assessment

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

Sampling Protocol

Dedicated electric Grundfos submersible pumps were installed in wells S(SG), L(SG), and OBS-3. Pumps were placed two feet above bottom (total depth) in each well. These wells were sampled after the well was purged dry and/or three casing volumes were removed as specified by program directive.

All other monitoring wells were sampled with dedicated bladder pumps and met Category I or II sampling criteria. Sample results for these monitoring wells were qualified with an "F" flag indicating the wells were purged and sampled using the low-flow sampling method. All wells met the Category I criteria with the exception of well E(M) that was classified as Category II. The sample results for this well were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

No equipment blanks were required because all samples were collected using dedicated equipment.

Field Duplicate Assessment

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. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location Y2(M) (field duplicate ID 2074). The non-radiochemical duplicate results met the criteria, demonstrating acceptable overall precision. The relative error ratio for radiochemical duplicate results (calculated using the one-sigma total propagated uncertainty) was less than three, indicating acceptable precision.

SAMPLE MANAGEMENT SYSTEM

Page 1 of 1

Validation Report: Field Duplicates

RIN: 11073944 Lab Code: PAR Project: Bluewater Validation Date: 10/21/2011

Duplicate: 2074

Sample: Y2(M)

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Alkalinity, Carbonate (CO3) as CaCO3	20	U		1	20	U		1			MG/L
Arsenic	1.5			1	1.5			1	0		UG/L
Bicarbonate	210			1	210			1	0		MG/L
Calcium	61000			1	61000			1	0		UG/L
CHLORIDE	17			5	17			2	0		MG/L
H-3	98.1	U	191	1	40.6	U	187	1		0.4	pCi/L
Magnesium	17000			1	17000			1	0		UG/L
Molybdenum	1.6			1	1.6			1	0		UG/L
Nitrate+Nitrite as N	1.4			1	1.3	N		1	7.41		MG/L
Potassium	3100			1	3200			1	3.17		UG/L
Selenium	1.2			1	1.2			1	0		UG/L
Sodium	47000			1	49000			1	4.17		UG/L
SULFATE	98			5	100			2	2.02		MG/L
TOTAL DISSOLVED SOLIDS	410			1	420			1	2.41		MG/L
Uranium	4.8			1	4.8			1	0		UG/L
Uranium-233+234	2.61		0.503	1	2.68		0.513	1	2.65	0.2	pCi/L
Uranium-235	0.101		0.0581	1	0.0772		0.0534	1		0.6	pCi/L
Uranium-238	1.63		0.338	1	1.64		0.339	1	0.61	0	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:

Steve Donovan
Steve Donovan

12-21-2011
Date

Data Validation Lead:

Steve Donovan
Steve Donovan

12-21-2011
Date

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 SEEPro database. The application compares the new data set 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.

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

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 11073944

Report Date: 12/9/2011

Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Current Qualifiers		Result	Historical Maximum Qualifiers		Result	Historical Minimum Qualifiers		Number of Data Points		Statistical Outlier
						Lab	Data		Lab	Data		Lab	Data	N	N Below Detect	
BLU01	E(M)	N001	07/27/2011	Selenium	0.000032	U	FQ	0.002	U		0.000038	B	FQJ	10	6	No
BLU01	OBS-3	0001	07/28/2011	Selenium	0.0079			0.005	B		0.000034	B	UF	8	6	No
BLU01	S(SG)	0001	07/26/2011	Selenium	0.011			0.004	B		0.000029	U	FQ	7	6	No
BLU01	T(M)	N001	07/26/2011	Selenium	0.0026		F	0.019		F	0.0041		F	7	0	No

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.

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: 12/9/2011

Location: 21(M) WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/27/2011	0001	139.6 - 149.6	20	U	F	#	20	
Arsenic	mg/L	07/27/2011	0001	139.6 - 149.6	0.0024		F	#	0.00003	
Bicarbonate	mg/L	07/27/2011	0001	139.6 - 149.6	260		F	#	20	
Calcium	mg/L	07/27/2011	0001	139.6 - 149.6	160		F	#	0.012	
Chloride	mg/L	07/27/2011	0001	139.6 - 149.6	170		F	#	4	
Magnesium	mg/L	07/27/2011	0001	139.6 - 149.6	42		F	#	0.013	
Molybdenum	mg/L	07/27/2011	0001	139.6 - 149.6	0.0011		F	#	0.000064	
Nitrate + Nitrite as Nitrogen	mg/L	07/27/2011	0001	139.6 - 149.6	7.9		F	#	0.1	
Oxidation Reduction Potential	mV	07/27/2011	N001	139.6 - 149.6	62		F	#		
pH	s.u.	07/27/2011	N001	139.6 - 149.6	7.28		F	#		
Potassium	mg/L	07/27/2011	0001	139.6 - 149.6	7.8		F	#	0.11	
Selenium	mg/L	07/27/2011	0001	139.6 - 149.6	0.01		F	#	0.000065	
Sodium	mg/L	07/27/2011	0001	139.6 - 149.6	190		F	#	0.033	
Specific Conductance	umhos/cm	07/27/2011	N001	139.6 - 149.6	1885		F	#		
Sulfate	mg/L	07/27/2011	0001	139.6 - 149.6	520		F	#	10	
Temperature	C	07/27/2011	N001	139.6 - 149.6	15.17		F	#		
Total Dissolved Solids	mg/L	07/27/2011	0001	139.6 - 149.6	1400		F	#	40	

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

REPORT DATE: 12/9/2011

Location: 21(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/27/2011	0001	139.6 - 149.6	320	U	F	#	320	188
Turbidity	NTU	07/27/2011	N001	139.6 - 149.6	29.1		F	#		
Uranium	mg/L	07/27/2011	0001	139.6 - 149.6	0.13		F	#	0.0000058	
Uranium-234	pCi/L	07/27/2011	0001	139.6 - 149.6	46.5		F	#	0.05	8
Uranium-235	pCi/L	07/27/2011	0001	139.6 - 149.6	2		F	#	0.058	0.437
Uranium-238	pCi/L	07/27/2011	0001	139.6 - 149.6	43		F	#	0.045	7.4

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

REPORT DATE: 12/9/2011

Location: 22(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/27/2011	N001	136.83 - 146.83	20	U	F	#	20	
Arsenic	mg/L	07/27/2011	N001	136.83 - 146.83	0.0027		F	#	0.000074	
Bicarbonate	mg/L	07/27/2011	N001	136.83 - 146.83	330		F	#	20	
Calcium	mg/L	07/27/2011	N001	136.83 - 146.83	100		F	#	0.012	
Chloride	mg/L	07/27/2011	N001	136.83 - 146.83	44		F	#	1	
Magnesium	mg/L	07/27/2011	N001	136.83 - 146.83	29		F	#	0.013	
Molybdenum	mg/L	07/27/2011	N001	136.83 - 146.83	0.0033		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	07/27/2011	N001	136.83 - 146.83	26		F	#	0.2	
Oxidation Reduction Potential	mV	07/27/2011	N001	136.83 - 146.83	75		F	#		
pH	s.u.	07/27/2011	N001	136.83 - 146.83	7.18		F	#		
Potassium	mg/L	07/27/2011	N001	136.83 - 146.83	6.7		F	#	0.11	
Selenium	mg/L	07/27/2011	N001	136.83 - 146.83	0.0076		F	#	0.00016	
Sodium	mg/L	07/27/2011	N001	136.83 - 146.83	170		F	#	0.033	
Specific Conductance	umhos/cm	07/27/2011	N001	136.83 - 146.83	1440		F	#		
Sulfate	mg/L	07/27/2011	N001	136.83 - 146.83	280		F	#	2.5	
Temperature	C	07/27/2011	N001	136.83 - 146.83	15.7		F	#		
Total Dissolved Solids	mg/L	07/27/2011	N001	136.83 - 146.83	1100		F	#	40	

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

REPORT DATE: 12/9/2011

Location: 22(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft/BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/27/2011	N001	136.83 - 146.83	310	U	F	#	310	186
Turbidity	NTU	07/27/2011	N001	136.83 - 146.83	6.55		F	#		
Uranium	mg/L	07/27/2011	N001	136.83 - 146.83	0.33		F	#	0.000015	
Uranium-234	pCi/L	07/27/2011	N001	136.83 - 146.83	117		F	#	0.11	22.4
Uranium-235	pCi/L	07/27/2011	N001	136.83 - 146.83	5.4		F	#	0.05	1.2
Uranium-238	pCi/L	07/27/2011	N001	136.83 - 146.83	116		F	#	0.11	22.1

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/27/2011	N001	68.6	- 89.8	5	U	FQ	#	5	
Arsenic	mg/L	07/27/2011	N001	68.6	- 89.8	0.000063	B	FQ	#	0.000015	
Bicarbonate	mg/L	07/27/2011	N001	68.6	- 89.8	7.7		FQ	#	5	
Calcium	mg/L	07/27/2011	N001	68.6	- 89.8	250		FQ	#	0.012	
Chloride	mg/L	07/27/2011	N001	68.6	- 89.8	39		FQ	#	4	
Magnesium	mg/L	07/27/2011	N001	68.6	- 89.8	61		FQ	#	0.013	
Molybdenum	mg/L	07/27/2011	N001	68.6	- 89.8	0.00031		FQ	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/27/2011	N001	68.6	- 89.8	0.01	U	FQ	#	0.01	
Oxidation Reduction Potential	mV	07/27/2011	N001	68.6	- 89.8	-60		FQ	#		
pH	s.u.	07/27/2011	N001	68.6	- 89.8	7.32		FQ	#		
Potassium	mg/L	07/27/2011	N001	68.6	- 89.8	5.4		FQ	#	0.11	
Selenium	mg/L	07/27/2011	N001	68.6	- 89.8	0.000032	U	FQ	#	0.000032	
Sodium	mg/L	07/27/2011	N001	68.6	- 89.8	58		FQ	#	0.0066	
Specific Conductance	umhos /cm	07/27/2011	N001	68.6	- 89.8	1600		FQ	#		
Sulfate	mg/L	07/27/2011	N001	68.6	- 89.8	870		FQ	#	10	
Temperature	C	07/27/2011	N001	68.6	- 89.8	15.8		FQ	#		
Total Dissolved Solids	mg/L	07/27/2011	N001	68.6	- 89.8	1500		FQ	#	40	

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft:BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/27/2011	N001	68.6	- 89.8	310	U	FQ	#	310	188
Turbidity	NTU	07/27/2011	N001	68.6	- 89.8	7.87		FQ	#		
Uranium	mg/L	07/27/2011	N001	68.6	- 89.8	0.00038		FQ	#	0.0000029	
Uranium-234	pCi/L	07/27/2011	N001	68.6	- 89.8	0.0673		UFQ	#	0.056	0.0485
Uranium-235	pCi/L	07/27/2011	N001	68.6	- 89.8	0.034	U	FQ	#	0.034	0.0261
Uranium-238	pCi/L	07/27/2011	N001	68.6	- 89.8	0.045	U	FQ	#	0.045	0.0259

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/28/2011	N001	94.2	- 114.87	20	U	F	#	20	
Arsenic	mg/L	07/28/2011	N001	94.2	- 114.87	0.0012		F	#	0.000015	
Bicarbonate	mg/L	07/28/2011	N001	94.2	- 114.87	170		F	#	20	
Calcium	mg/L	07/28/2011	N001	94.2	- 114.87	72		F	#	0.012	
Chloride	mg/L	07/28/2011	N001	94.2	- 114.87	13		F	#	0.4	
Magnesium	mg/L	07/28/2011	N001	94.2	- 114.87	19		F	#	0.013	
Molybdenum	mg/L	07/28/2011	N001	94.2	- 114.87	0.00085		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/28/2011	N001	94.2	- 114.87	0.68		F	#	0.01	
Oxidation Reduction Potential	mV	07/28/2011	N001	94.2	- 114.87	89		F	#		
pH	s.u.	07/28/2011	N001	94.2	- 114.87	7.68		F	#		
Potassium	mg/L	07/28/2011	N001	94.2	- 114.87	3		F	#	0.11	
Selenium	mg/L	07/28/2011	N001	94.2	- 114.87	0.0012		F	#	0.000032	
Sodium	mg/L	07/28/2011	N001	94.2	- 114.87	19		F	#	0.0066	
Specific Conductance	umhos /cm	07/28/2011	N001	94.2	- 114.87	565		F	#		
Sulfate	mg/L	07/28/2011	N001	94.2	- 114.87	110		F	#	1	
Temperature	C	07/28/2011	N001	94.2	- 114.87	15.61		F	#		
Total Dissolved Solids	mg/L	07/28/2011	N001	94.2	- 114.87	420		F	#	20	

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/28/2011	N001	94.2 - 114.87	320	U	F	#	320	191
Turbidity	NTU	07/28/2011	N001	94.2 - 114.87	8.17		F	#		
Uranium	mg/L	07/28/2011	N001	94.2 - 114.87	0.0074		F	#	0.0000029	
Uranium-234	pCi/L	07/28/2011	N001	94.2 - 114.87	3.4		F	#	0.037	0.62
Uranium-235	pCi/L	07/28/2011	N001	94.2 - 114.87	0.123		F	#	0.018	0.0597
Uranium-238	pCi/L	07/28/2011	N001	94.2 - 114.87	2.44		F	#	0.031	0.461

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/27/2011	N001	-	10	U	F	#	10	
Arsenic	mg/L	07/27/2011	N001	-	0.00035		F	#	0.000015	
Bicarbonate	mg/L	07/27/2011	N001	-	72		F	#	10	
Calcium	mg/L	07/27/2011	N001	-	11		F	#	0.012	
Chloride	mg/L	07/27/2011	N001	-	190		F	#	2	
Magnesium	mg/L	07/27/2011	N001	-	8.9		F	#	0.013	
Molybdenum	mg/L	07/27/2011	N001	-	0.00081		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/27/2011	N001	-	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	07/27/2011	N001	-	-130		F	#		
pH	s.u.	07/27/2011	N001	-	8.96		F	#		
Potassium	mg/L	07/27/2011	N001	-	6.1		F	#	0.11	
Selenium	mg/L	07/27/2011	N001	-	0.000032	U	F	#	0.000032	
Sodium	mg/L	07/27/2011	N001	-	150		F	#	0.0066	
Specific Conductance	umhos/cm	07/27/2011	N001	-	960		F	#		
Sulfate	mg/L	07/27/2011	N001	-	79		F	#	5	
Temperature	C	07/27/2011	N001	-	17.1		F	#		
Total Dissolved Solids	mg/L	07/27/2011	N001	-	530		F	#	20	

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/27/2011	N001	-	320	U	F	#	320	186
Turbidity	NTU	07/27/2011	N001	-	9.89		F	#		
Uranium	mg/L	07/27/2011	N001	-	0.0011		F	#	0.0000029	
Uranium-234	pCi/L	07/27/2011	N001	-	0.476		F	#	0.088	0.139
Uranium-235	pCi/L	07/27/2011	N001	-	0.054	U	F	#	0.054	0.0332
Uranium-238	pCi/L	07/27/2011	N001	-	0.449		F	#	0.053	0.129

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/27/2011	0001	-	20	U		#	20	
Arsenic	mg/L	07/27/2011	0001	-	0.00013			#	0.000015	
Bicarbonate	mg/L	07/27/2011	0001	-	550			#	20	
Calcium	mg/L	07/27/2011	0001	-	150			#	0.012	
Chloride	mg/L	07/27/2011	0001	-	210			#	4	
Magnesium	mg/L	07/27/2011	0001	-	77			#	0.013	
Molybdenum	mg/L	07/27/2011	0001	-	0.00043			#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/27/2011	0001	-	0.01	U		#	0.01	
Oxidation Reduction Potential	mV	07/27/2011	N001	-	-5			#		
pH	s.u.	07/27/2011	N001	-	6.71			#		
Potassium	mg/L	07/27/2011	0001	-	13			#	0.11	
Selenium	mg/L	07/27/2011	0001	-	0.000032	U		#	0.000032	
Sodium	mg/L	07/27/2011	0001	-	310			#	0.033	
Specific Conductance	umhos /cm	07/27/2011	N001	-	2540			#		
Sulfate	mg/L	07/27/2011	0001	-	600			#	10	
Temperature	C	07/27/2011	N001	-	19			#		
Total Dissolved Solids	mg/L	07/27/2011	0001	-	1700			#	40	

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/27/2011	0001	-	320	U		#	320	192
Turbidity	NTU	07/27/2011	N001	-	29.2			#		
Uranium	mg/L	07/27/2011	0001	-	0.0032			#	0.0000029	
Uranium-234	pCi/L	07/27/2011	0001	-	1.85			#	0.057	0.381
Uranium-235	pCi/L	07/27/2011	0001	-	0.108		J	#	0.054	0.0641
Uranium-238	pCi/L	07/27/2011	0001	-	1.11			#	0.061	0.255

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/28/2011	0001	152.4	- 350	20	U		#	20	
Arsenic	mg/L	07/28/2011	0001	152.4	- 350	0.000079	B		#	0.000015	
Bicarbonate	mg/L	07/28/2011	0001	152.4	- 350	270			#	20	
Calcium	mg/L	07/28/2011	0001	152.4	- 350	210			#	0.012	
Chloride	mg/L	07/28/2011	0001	152.4	- 350	590			#	10	
Magnesium	mg/L	07/28/2011	0001	152.4	- 350	170			#	0.013	
Molybdenum	mg/L	07/28/2011	0001	152.4	- 350	0.00065			#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/28/2011	0001	152.4	- 350	1.6			#	0.01	
Oxidation Reduction Potential	mV	07/28/2011	N001	152.4	- 350	-127.1			#		
pH	s.u.	07/28/2011	N001	152.4	- 350	7.18			#		
Potassium	mg/L	07/28/2011	0001	152.4	- 350	22			#	0.11	
Selenium	mg/L	07/28/2011	0001	152.4	- 350	0.0079			#	0.000032	
Sodium	mg/L	07/28/2011	0001	152.4	- 350	390			#	0.066	
Specific Conductance	umhos /cm	07/28/2011	N001	152.4	- 350	3877			#		
Sulfate	mg/L	07/28/2011	0001	152.4	- 350	1000			#	25	
Temperature	C	07/28/2011	N001	152.4	- 350	17.94			#		
Total Dissolved Solids	mg/L	07/28/2011	0001	152.4	- 350	3000			#	80	

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/28/2011	0001	152.4 - 350	320	U		#	320	191
Turbidity	NTU	07/28/2011	N001	152.4 - 350	104			#		
Uranium	mg/L	07/28/2011	0001	152.4 - 350	0.12			#	0.0000058	
Uranium-234	pCi/L	07/28/2011	0001	152.4 - 350	37.2			#	0.051	6.36
Uranium-235	pCi/L	07/28/2011	0001	152.4 - 350	2.35			#	0.041	0.489
Uranium-238	pCi/L	07/28/2011	0001	152.4 - 350	39.8			#	0.051	6.8

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/26/2011	0001	159 - 280	20	U		#	20	
Arsenic	mg/L	07/26/2011	0001	159 - 280	0.00022			#	0.000015	
Bicarbonate	mg/L	07/26/2011	0001	159 - 280	270			#	20	
Calcium	mg/L	07/26/2011	0001	159 - 280	410			#	0.012	
Chloride	mg/L	07/26/2011	0001	159 - 280	800			#	10	
Magnesium	mg/L	07/26/2011	0001	159 - 280	180			#	0.013	
Molybdenum	mg/L	07/26/2011	0001	159 - 280	0.00073			#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/26/2011	0001	159 - 280	2.1			#	0.02	
Oxidation Reduction Potential	mV	07/26/2011	N001	159 - 280	-97.1			#		
pH	s.u.	07/26/2011	N001	159 - 280	6.83			#		
Potassium	mg/L	07/26/2011	0001	159 - 280	21			#	0.11	
Selenium	mg/L	07/26/2011	0001	159 - 280	0.011			#	0.000032	
Sodium	mg/L	07/26/2011	0001	159 - 280	390			#	0.066	
Specific Conductance	umhos/cm	07/26/2011	N001	159 - 280	4421			#		
Sulfate	mg/L	07/26/2011	0001	159 - 280	1200			#	25	
Temperature	C	07/26/2011	N001	159 - 280	16.06			#		
Total Dissolved Solids	mg/L	07/26/2011	0001	159 - 280	3600			#	80	

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/26/2011	0001	159 - 280	320	U		#	320	190
Turbidity	NTU	07/26/2011	N001	159 - 280	107			#		
Uranium	mg/L	07/26/2011	0001	159 - 280	0.26			#	0.000015	
Uranium-234	pCi/L	07/26/2011	0001	159 - 280	71			#	0.093	12.9
Uranium-235	pCi/L	07/26/2011	0001	159 - 280	4.5			#	0.079	0.955
Uranium-238	pCi/L	07/26/2011	0001	159 - 280	77.4			#	0.081	14.1

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/26/2011	N001	128	-	133	20	U	F	#	20	
Arsenic	mg/L	07/26/2011	N001	128	-	133	0.0034		F	#	0.00015	
Bicarbonate	mg/L	07/26/2011	N001	128	-	133	410		F	#	20	
Calcium	mg/L	07/26/2011	N001	128	-	133	120		F	#	0.012	
Chloride	mg/L	07/26/2011	N001	128	-	133	46		F	#	1	
Magnesium	mg/L	07/26/2011	N001	128	-	133	32		F	#	0.013	
Molybdenum	mg/L	07/26/2011	N001	128	-	133	0.024		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	07/26/2011	N001	128	-	133	49		F	#	0.5	
Oxidation Reduction Potential	mV	07/26/2011	N001	128	-	133	95.2		F	#		
pH	s.u.	07/26/2011	N001	128	-	133	6.94		F	#		
Potassium	mg/L	07/26/2011	N001	128	-	133	5.9		F	#	0.11	
Selenium	mg/L	07/26/2011	N001	128	-	133	0.0026		F	#	0.00032	
Sodium	mg/L	07/26/2011	N001	128	-	133	200		F	#	0.033	
Specific Conductance	umhos/cm	07/26/2011	N001	128	-	133	1679		F	#		
Sulfate	mg/L	07/26/2011	N001	128	-	133	250		F	#	2.5	
Temperature	C	07/26/2011	N001	128	-	133	17.52		F	#		
Total Dissolved Solids	mg/L	07/26/2011	N001	128	-	133	1200		F	#	40	

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

REPORT DATE: 12/9/2011

Location: T(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	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Tritium	pCi/L	07/26/2011	N001	128 - 133	310	U	F	#	310	188
Turbidity	NTU	07/26/2011	N001	128 - 133	6.53		F	#		
Uranium	mg/L	07/26/2011	N001	128 - 133	0.53		F	#	0.000029	
Uranium-234	pCi/L	07/26/2011	N001	128 - 133	176		FJ	#	0.21	36.8
Uranium-235	pCi/L	07/26/2011	N001	128 - 133	9.7		FJ	#	0.076	2.27
Uranium-238	pCi/L	07/26/2011	N001	128 - 133	182		FJ	#	0.15	38.1

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/28/2011	N001	98	-	123	20	U	F	#	20	
Alkalinity, Carbonate (as CaCO ₃)	mg/L	07/28/2011	N002	98	-	123	20	U	F	#	20	
Arsenic	mg/L	07/28/2011	N001	98	-	123	0.0015		F	#	0.000015	
Arsenic	mg/L	07/28/2011	N002	98	-	123	0.0015		F	#	0.000015	
Bicarbonate	mg/L	07/28/2011	N001	98	-	123	210		F	#	20	
Bicarbonate	mg/L	07/28/2011	N002	98	-	123	210		F	#	20	
Calcium	mg/L	07/28/2011	N001	98	-	123	61		F	#	0.012	
Calcium	mg/L	07/28/2011	N002	98	-	123	61		F	#	0.012	
Chloride	mg/L	07/28/2011	N001	98	-	123	17		F	#	1	
Chloride	mg/L	07/28/2011	N002	98	-	123	17		F	#	0.4	
Magnesium	mg/L	07/28/2011	N001	98	-	123	17		F	#	0.013	
Magnesium	mg/L	07/28/2011	N002	98	-	123	17		F	#	0.013	
Molybdenum	mg/L	07/28/2011	N001	98	-	123	0.0016		F	#	0.000032	
Molybdenum	mg/L	07/28/2011	N002	98	-	123	0.0016		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	07/28/2011	N001	98	-	123	1.4		FJ	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	07/28/2011	N002	98	-	123	1.3	N	FJ	#	0.01	
Oxidation Reduction Potential	mV	07/28/2011	N001	98	-	123	80		F	#		
pH	s.u.	07/28/2011	N001	98	-	123	7.52		F	#		

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

REPORT DATE: 12/9/2011

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	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Potassium	mg/L	07/28/2011	N001	98 - 123	3.1		F	#	0.11	
Potassium	mg/L	07/28/2011	N002	98 - 123	3.2		F	#	0.11	
Selenium	mg/L	07/28/2011	N001	98 - 123	0.0012		F	#	0.000032	
Selenium	mg/L	07/28/2011	N002	98 - 123	0.0012		F	#	0.000032	
Sodium	mg/L	07/28/2011	N001	98 - 123	47		F	#	0.0066	
Sodium	mg/L	07/28/2011	N002	98 - 123	49		F	#	0.0066	
Specific Conductance	umhos/cm	07/28/2011	N001	98 - 123	630		F	#		
Sulfate	mg/L	07/28/2011	N001	98 - 123	98		F	#	2.5	
Sulfate	mg/L	07/28/2011	N002	98 - 123	100		F	#	1	
Temperature	C	07/28/2011	N001	98 - 123	15		F	#		
Total Dissolved Solids	mg/L	07/28/2011	N001	98 - 123	410		F	#	20	
Total Dissolved Solids	mg/L	07/28/2011	N002	98 - 123	420		F	#	20	
Tritium	pCi/L	07/28/2011	N001	98 - 123	320	U	F	#	320	191
Tritium	pCi/L	07/28/2011	N002	98 - 123	310	U	F	#	310	187
Turbidity	NTU	07/28/2011	N001	98 - 123	4.05		F	#		
Uranium	mg/L	07/28/2011	N001	98 - 123	0.0048		F	#	0.0000029	
Uranium	mg/L	07/28/2011	N002	98 - 123	0.0048		F	#	0.0000029	
Uranium-234	pCi/L	07/28/2011	N001	98 - 123	2.61		F	#	0.056	0.503

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

REPORT DATE: 12/9/2011

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

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Uranium-234	pCi/L	07/28/2011	N002	98 - 123	2.68		F	#	0.048	0.513
Uranium-235	pCi/L	07/28/2011	N001	98 - 123	0.101		FJ	#	0.035	0.0581
Uranium-235	pCi/L	07/28/2011	N002	98 - 123	0.0772		UF	#	0.054	0.0534
Uranium-238	pCi/L	07/28/2011	N001	98 - 123	1.63		F	#	0.04	0.338
Uranium-238	pCi/L	07/28/2011	N002	98 - 123	1.64		F	#	0.048	0.339

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.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 12/9/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
21(M)		NA	07/27/2011	17:50:47	127.54	NA	
22(M)		NA	07/27/2011	15:15:09	136.46	NA	
E(M)		6613.08	07/27/2011	12:45:01	81.46	6531.62	
F(M)		6600.31	07/28/2011	09:05:49	113.47	6486.84	
I(SG)		6616.17	07/27/2011	16:50:18	199.19	6416.98	
L(SG)		6602.6	07/27/2011	13:20:02	160.82	6441.78	
OBS-3		6612.6	07/28/2011	09:45:30	182	6430.6	
T(M)		6609.4	07/26/2011	16:30:52	133.93	6475.47	
X(M)			07/28/2011				D
Y2(M)		6605.4	07/28/2011	08:15:49	117.51	6487.89	

NA – Not available

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

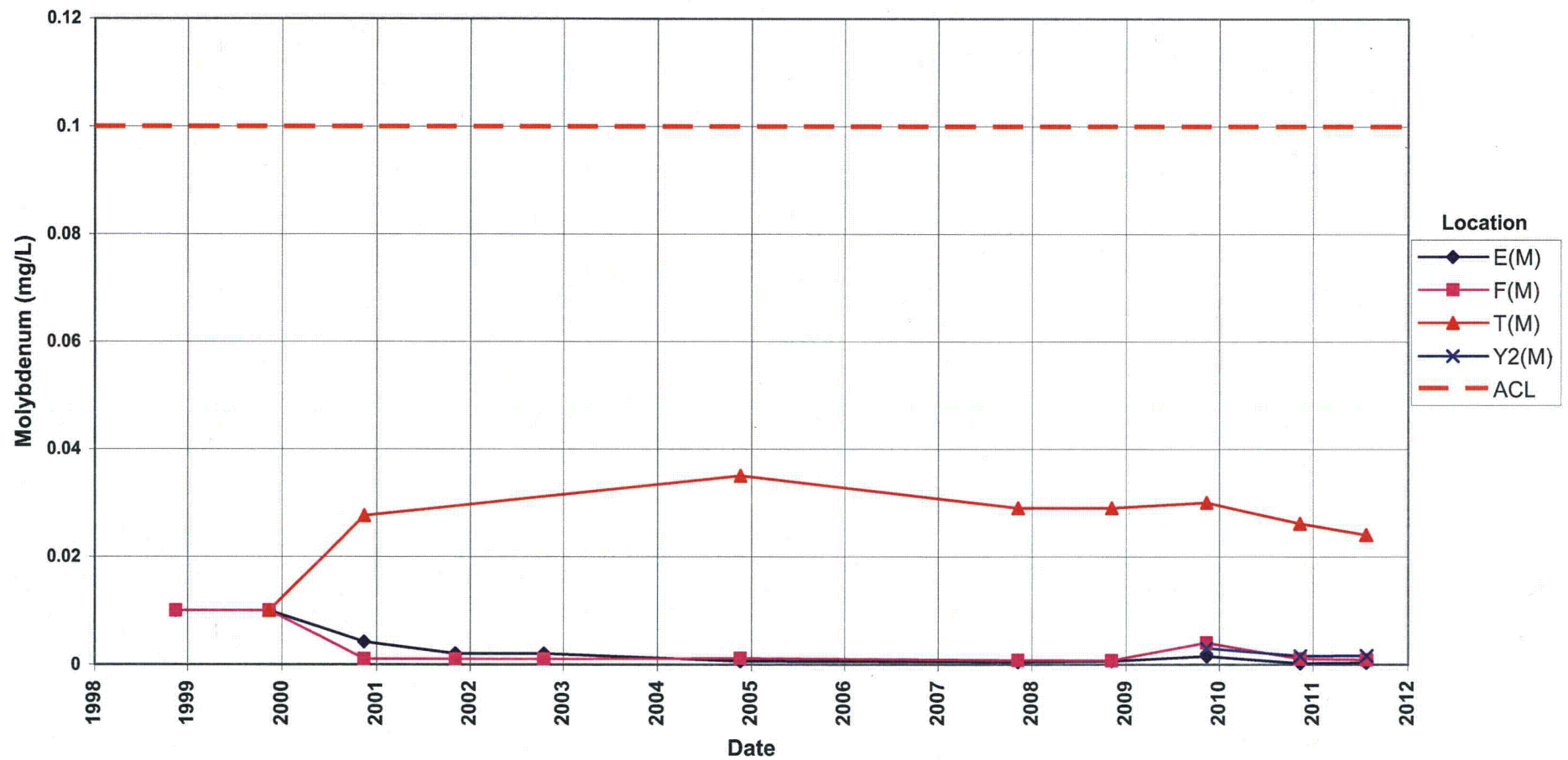
WATER LEVEL FLAGS: D Dry

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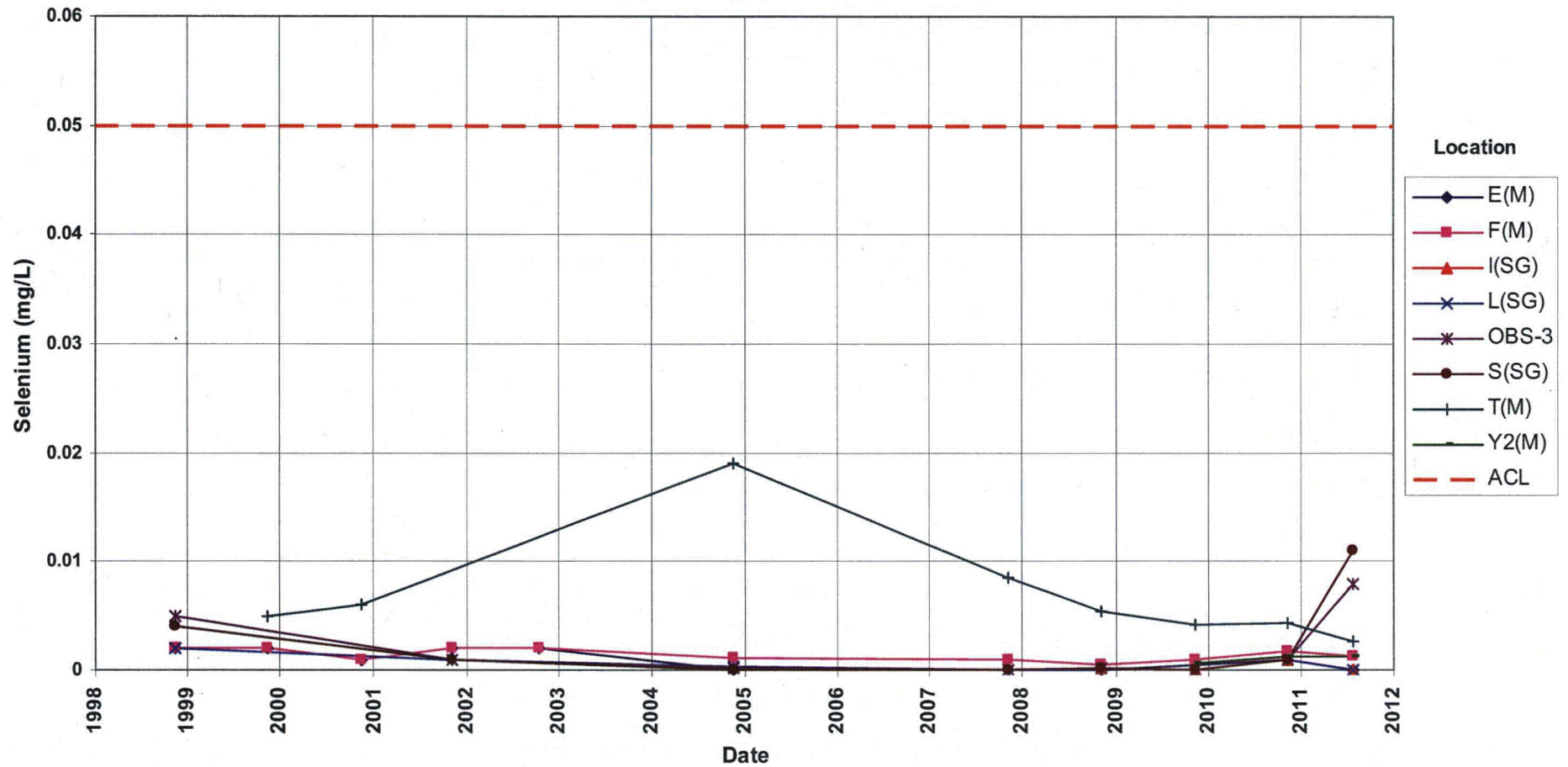
Time-Concentration Graphs

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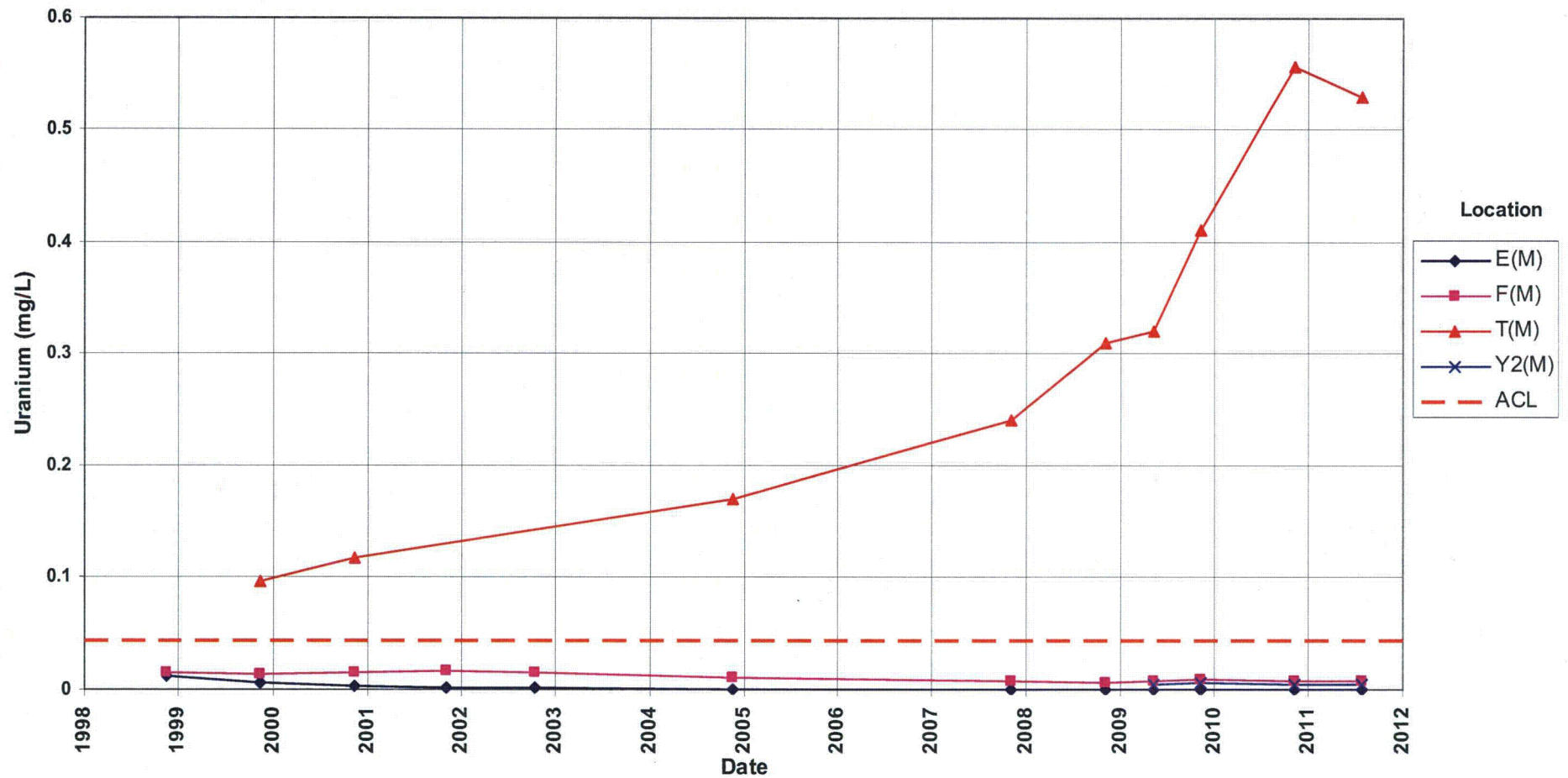
Bluewater Disposal Site
Alluvium Wells
Molybdenum Concentration
Alternate Concentration Limit (ACL) = 0.1 mg/L



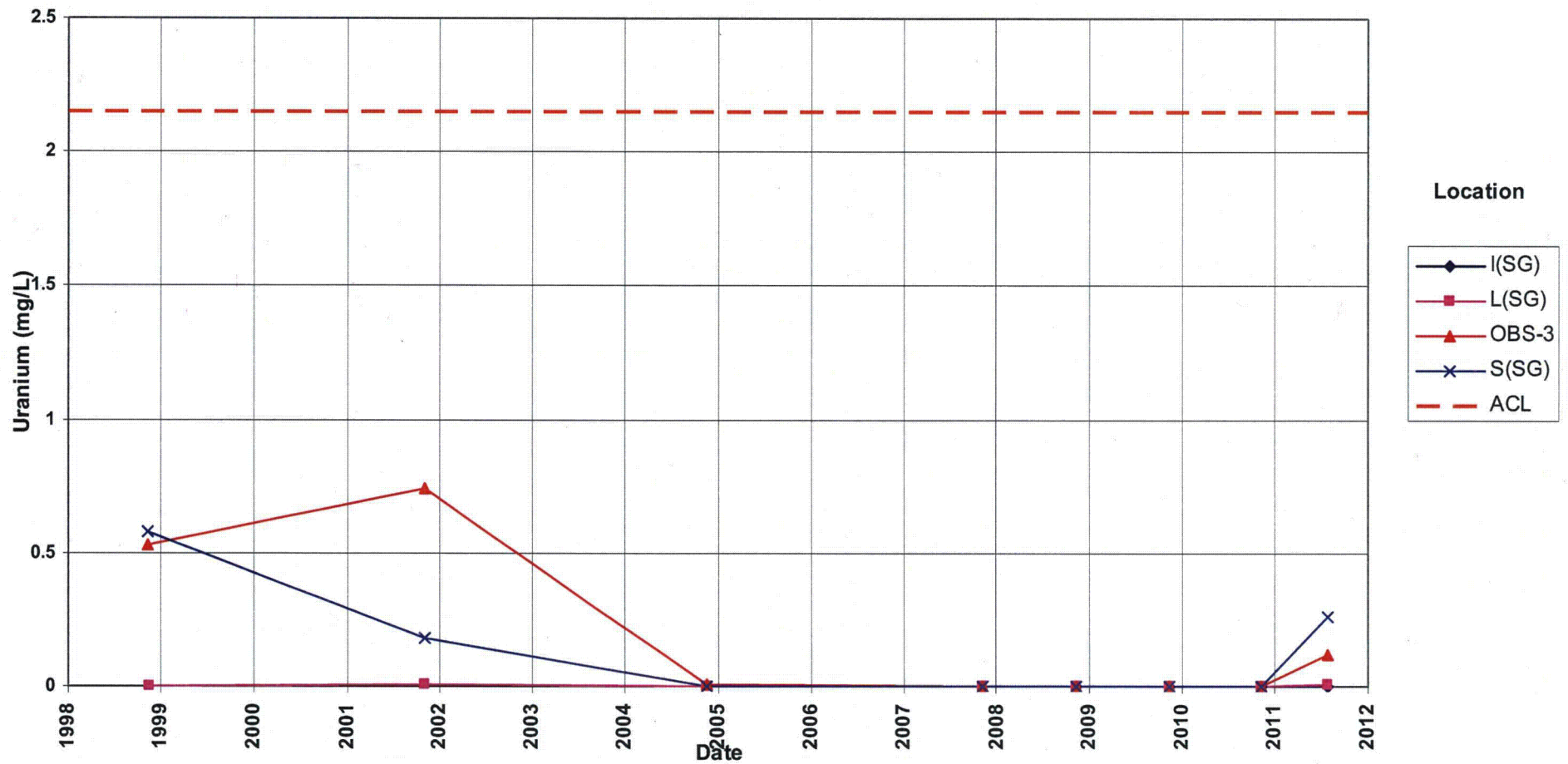
Bluewater Disposal Site
Alluvium and Bedrock Wells
Selenium Concentration
Alternate Concentration Limit (ACL) = 0.05 mg/L



Bluewater Disposal Site
Alluvium Wells
Uranium Concentration
Alternate Concentration Limit (ACL) = 0.44 mg/L

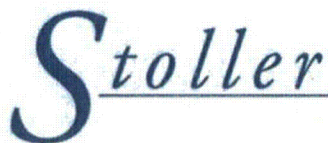


Bluewater Disposal Site
Bedrock Wells
Uranium Concentration
Alternate Concentration Limit (ACL) = 2.15 mg/L



Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM00-501
Control Number 11-0662

May 16, 2011

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
July 2011 Environmental Sampling at Bluewater, New Mexico

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

Dear Dr. Gil:

The purpose of this letter is to inform you of the upcoming sampling event at Bluewater, NM. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Bluewater Disposal Site. Water quality data will be collected at this site as part of the environmental sampling currently scheduled to begin the week of July 11, 2011.

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

Monitoring Wells*

E(M) Al	F(M) Al	T(M) Al	Y2(M) Al	X(M) Al	L(SG) Sg	S(SG) Sg
OBS-3 Sg	I(SG) 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.

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

Sincerely,

Richard K. Johnson
2011.05.16 12:51:04
-06'00'

Richard K. Johnson
Site Lead

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

Dr. April Gil
Control Number 11-0662
Page 2

RKJ/lcg/lb

Enclosures (3)

cc: (electronic)

Steve Donovan, Stoller

Bev Gallagher, Stoller

Lauren Goodknight, Stoller

Dick Johnson, Stoller

EDD Delivery

rc-grand.junction

File: SHP 410.02(A)

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				PCBs in November only
L(SG)		X				
S(SG)		X				
OBS-3		X				
I(SG)		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	9	0			
Field Measurements					
Alkalinity					
Dissolved Oxygen	X				
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements					
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
Iron					
Lead					
Magnesium	X		5	SW-846 6010	LMM-01
Manganese					
Molybdenum	X		0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO ₃ +NO ₂)-N	X		0.05	EPA 353.1	WCH-A-022
PCBs					
Potassium	X		1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium	X		0.0001	SW-846 6020	LMM-02
Silica					
Sodium	X		1	SW-846 6010	LMM-01
Strontium					
Sulfate	X		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	X		10	SM2540 C	WCH-A-033
Total Organic Carbon					
Tritium	X		400 pCi/L	Liquid Scintillation	LSC-A-001
Uranium	X		0.0001	SW-846 6020	LMM-02
U-234, -238	X		1 pCi/L	Alpha Spectrometry	ASP-A-024
Vanadium					
Zinc					
Total No. of Analytes	16	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.

Attachment 4

Trip Report

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Memorandum

Control Number N/A

DATE: August 8, 2011
TO: Dick Johnson
FROM: Jeff Price
SUBJECT: Sampling Trip Report

Site: Bluewater, NM.

Dates of Sampling Event: July 25-28, 2011

Team Members: David Atkinson and Jeff Price

Number of Locations Sampled: Ten monitoring well samples were collected for analysis of Ca, K, Mg, Na, As, Mo, Se, U, Cl, Alk-Carb, Alk-Bicarb, SO₄, TDS, (NO₃+NO₂)-N, tritium, and U-234/238. One duplicate sample was collected for QA/QC purposes. Because all sampling equipment is dedicated, equipment blanks were not required.

Locations Not Sampled/Reason: Monitoring well X(M) was dry.

Location Specific Information: Dedicated electric Grundfos Redi-Flo 3 submersible pumps were installed in wells S(SG), L(SG), and OBS-3. Pumps were placed two feet of above bottom (total depth) in each well.

Field Variance: Wells S(SG), L(SG), and OBS-3 were not sampled according to micro-purge procedures. Instead, the wells were sampled, following an approved field variance, after the well was purged dry and or three casing volumes were removed. Details of the well purge volumes were recorded on the field data sheets.

Quality Control Sample Cross Reference: The following is the false identification assigned to the quality control sample:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2074	Y2(M)	Duplicate	Groundwater	JIV 568

RIN Number Assigned: All samples were assigned to RIN 11073944.

Sample Shipment: Samples were shipped on July 28 from Farmington, New Mexico, (via FedEx) to ALS Labs in Fort Collins, Colorado.

Well Inspection Summary: All sampled wells were in adequate condition.

Equipment: All equipment functioned properly.

Water Level Measurements: Water levels were obtained in all sampled wells except for S(SG); which was simply missed.

Institutional Controls: All gates were appropriately closed and locked during and after the sampling event.

Fences, Gates, Locks: All were in good condition.

Signs: No missing or vandalized signs were observed.

Trespassing/Site Disturbances: None observed

Site Issues:

Disposal Cell/Drainage Structure Integrity: NA

Vegetation/Noxious Weed Concerns: NA

Maintenance Requirements: NA

Corrective Action Taken: None

(JP/lcg)

cc: (electronic)
April Gil, DOE
Steve Donovan, Stoller
EDD Delivery

Data Validation Package for the Bluewater, New Mexico, Disposal Site, July 2011

The U.S. Department of Energy (DOE) has prepared a Data Validation Package containing the groundwater monitoring data generated from the July 2011 sampling event at the Bluewater, New Mexico, Site. **At your request, you are receiving a hard copy of the report.**

The report is also available for your review on the Internet at the DOE Office of Legacy Management (LM) website– www.lm.doe.gov. From the LM website home page, select the United States map icon titled Legacy Management Sites. Then select Bluewater Site from the drop-down list. The report will be available on the Bluewater Site page of the LM website under Site Documents and Links.



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