Data Validation Package

June 2012
Groundwater and Surface Water Sampling at the Riverton, Wyoming, Processing Site

August 2012

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Riverton, Wyoming, Processing Site

Sampling Period: June 11–13, 2012

The 2009 *Long-Term Management Plan for the Riverton, Wyoming, Processing Site* requires semiannual monitoring to evaluate groundwater conditions and assess the progress of natural flushing of the uppermost aquifer. This event comprised sampling 18 monitoring wells, 9 surface water locations, and 11 domestic wells at the Riverton, Wyoming, Processing Site.

Water levels were measured at all sampled monitoring wells and 15 additional monitoring wells that were not sampled. Sampling and analyses were conducted as specified in the Long-Term Management Plan and the *Sampling and Analysis Plan for the U. S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated).

Concentrations of molybdenum and uranium in samples collected from semi-confined aquifer monitoring wells were below their respective U.S. Environmental Protection Agency (EPA) (Title 40 *Code of Federal Regulations* [CFR] Part 192) groundwater standard. The EPA groundwater standards for molybdenum and uranium were exceeded in samples collected from surficial aquifer monitoring wells listed in Table 1. Time-concentration graphs are included in the Data Presentation section.

Table 1. Riverton Wells with Samples that Exceeded EPA Groundwater Standards in June 2012

Analyte	Standard [a]	Location	Concentration in mg/L
Molybdenum	0.1	0707	0.9
		0716	0.13
		0722R	0.13
		0789	0.56
Uranium	0.044	0707	1.0
		0716	0.30
		0718	0.16
		0722R	0.51
		0788	0.05
		0789	2.1
		0826	0.05

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A.
mg/L = milligrams per liter

Groundwater samples were analyzed for selenium during this event in response to a recommendation made in the *Evaluation of Groundwater Constituents and Seasonal Variation at the Riverton, Wyoming, Processing Site*. Selenium concentrations were one to three orders of magnitude below the EPA groundwater standard (40 CFR 192) of 0.01 mg/L.

Results from domestic wells (Table 2) did not indicate any impacts from the Riverton site. Concentrations of molybdenum in samples collected from domestic wells were two orders of

magnitude below the EPA groundwater standard, and uranium concentrations in samples collected from domestic wells were one to three orders of magnitude below the drinking water standard.

Table 2. Concentrations of Molybdenum and Uranium in Samples from Domestic Wells

Analyte	Standard [a]	Location	Concentration in mg/L
Molybdenum	0.1	0405	0.003
		0422	0.0012
		0430	0.0021
		0436	0.0029
		0460	0.0026
		0828	0.0028
		0838	0.003
		0839	0.0032
		0840	0.0034
		0841	0.003
		0842	0.0023
Uranium	0.03	0405	0.00004
		0422	0.0024
		0430	0.00003
		0436	0.00007
		0460	0.00005
		0828	0.00015
		0838	0.0024
		0839	0.00045
		0840	0.0011
		0841	0.0029
		0842	0.00047

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A (molybdenum) and EPA's National Primary Drinking Water Regulations (uranium).
mg/L = milligrams per liter

Surface water uranium results were compared to statistical benchmark values derived using historical data from the Little Wind River location 0794, which is located upstream of the site and represents background conditions. As shown in Table 3, the benchmark value was exceeded only in the oxbow lake (0747), which was formed by a shift in the river path in 1994. Hydraulic and water quality data indicate that the oxbow lake is fed by the discharge of contaminated groundwater; therefore, elevated concentrations are expected. At the time of this sampling event, water was not flowing from the river into the lake. The other locations had uranium concentrations below the benchmark value, which indicates minimal site-related impact on the water quality of the Little Wind River and of the other surface water features. Time-concentration graphs of molybdenum and uranium results at all surface water locations are included in the Data Presentation section.

Table 3. Comparison of Surface Water Concentrations (June 2012) to Benchmark

Location		Uranium Concentration (mg/L)
Benchmark		**0.010**
0794	Little Wind River, Benchmark Location	0.0044
0796	Little Wind River	0.0026
0811	Little Wind River	0.0034
0812	Little Wind River	0.0040
0747	Oxbow Lake	0.140
0810	Constructed Wetlands	0.0051
0822	West Side Irrigation Ditch	0.0038
0823	Gravel Pit Pond	0.0061
0749	Sulfuric acid plant ditch	0.0013

mg/L = milligrams per liter

The sample collected at the ditch that discharges from the Chemtrade sulfuric acid plant (0749) continues to have elevated concentrations of sulfate (2,000 mg/L). The elevated sulfate concentration in the sulfuric acid plant effluent has affected the sulfate concentration downstream in the west side irrigation ditch (960 mg/L at location 0822).

Water samples from location 0822 (west side irrigation ditch) were analyzed for radium-226 and radium-228 in response to potentially elevated concentrations of these constituents in the sediments within the ditch. The radium-226 concentration was below, and radium-228 concentration slightly above the respective Decision Level Concentrations (DLC).

Sam Campbell
Site Lead, S.M. Stoller Corporation

9/21/2012
Date

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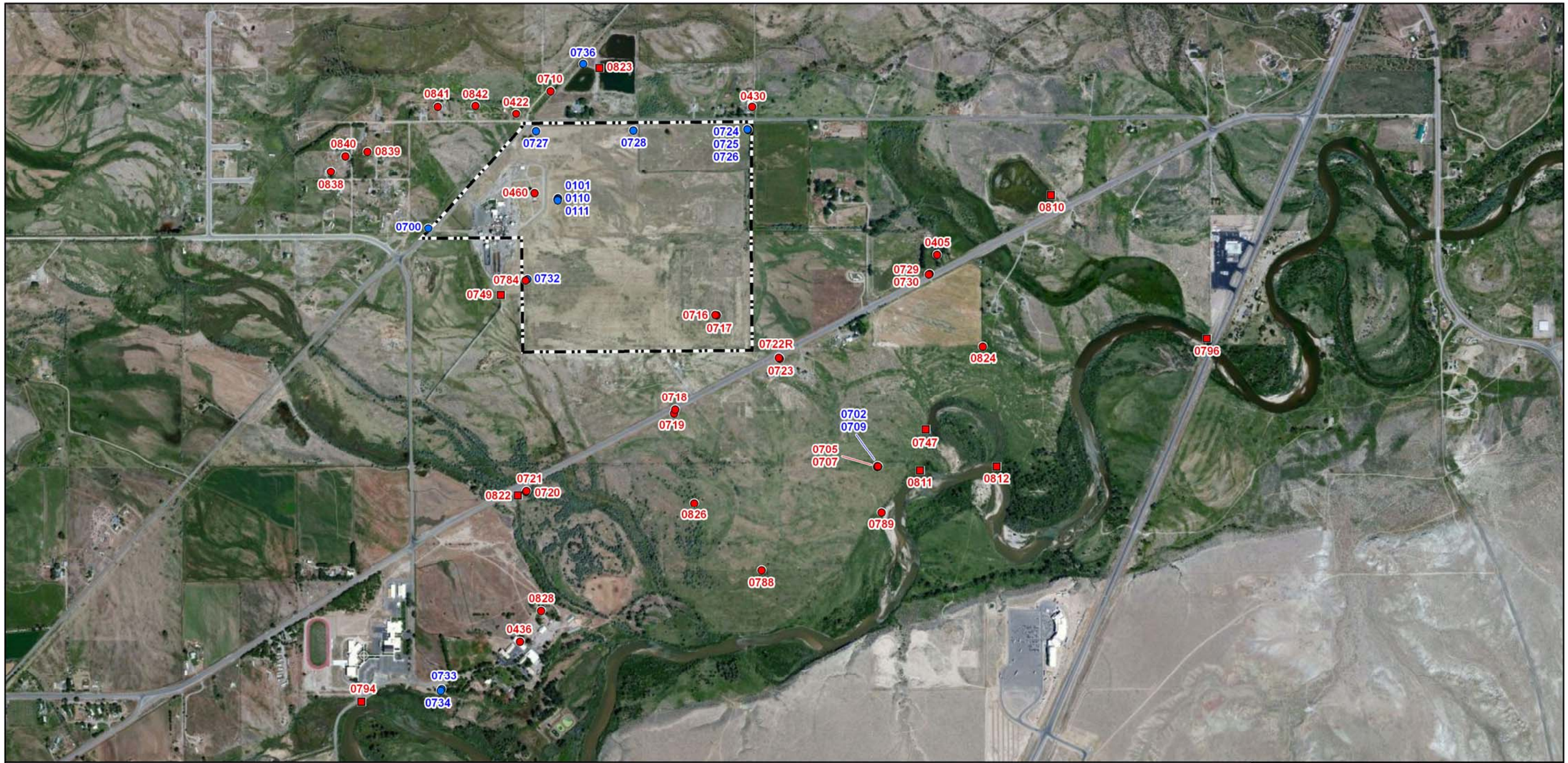

Riverton, Wyoming, Processing Site, Sample Locations

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Riverton, Wyoming	**Date(s) of Water Sampling**	June 11–13, 2012
Date(s) of Verification	July 31, 2012	**Name of Verifier**	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order letter dated May 16, 2012.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on June 8, 2012.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
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?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	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?	No	One duplicate sample was collected from location 0789.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One equipment blank was collected based on 9 locations sampled with non-dedicated equipment.
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	
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?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	12054590
Sample Event:	June 11–13, 2012
Site(s):	Riverton, Wyoming
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1206236
Analysis:	Metals, Wet Chemistry, and Radiochemistry
Validator:	Steve Donivan
Review Date:	July 26, 2012

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. 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
Chloride	MIS-A-039	EPA 300.0	EPA 300.0
Metals: Ca K, Mg, Mn, Na	LMM-01	SW-846 3005A	SW-846 6010B
Metals: Mo, Se, U	LMM-02	SW-846 3005A	SW-846 6020A
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Radium-226	GPC-A-018	PA SOP712R14	PA SOP724R10
Radium-228	GPC-A-020	PA SOP746R8	PA SOP724R10
Sulfate	MIS-A-044	EPA 300.0	EPA 300.0

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
1206236-24	0794	Manganese	J	Serial dilution failure
1206236-24	0794	Sodium	J	Serial dilution failure
1206236-29	0822	Radium-228	J	Less than the determination limit

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 40 water samples on June 16, 2012, accompanied by a Chain of Custody (COC) form. The COC 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 sample submittal documents had no errors or omissions with the following exception. Radium-226 and radium-228 were listed on the COC form as requested analytes for the equipment blank collected. However these analyses were not required for the equipment blank and aliquots not submitted.

Preservation and Holding Times

The sample shipment was received cool and intact with the temperature inside the iced cooler at 3.8 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All analyses were performed within the required holding times.

Detection and Quantitation Limits

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

For radiochemical analytes (those measured by radiometric counting) the MDL and PQL are not applicable, and these results are evaluated using the minimum detectable concentration (MDC), 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.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be

capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method 353.2, Nitrate + Nitrite as N
The calibration for nitrate + nitrite as N was performed using seven calibration standards on June 22, 2012. The calibration curve correlation coefficient value was greater than 0.995 and the absolute value of the intercept was less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in three verification checks. The calibration checks met the acceptance criteria.

Method SW-846 6010, Calcium, Manganese, Magnesium, Potassium, Sodium
Calibrations for manganese were performed on June 25, 2012, using four calibration standards. 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 20 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 6020, Molybdenum, Selenium, Uranium
Calibrations for molybdenum and uranium were performed on June 27, 2012, using four calibration standards. 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 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. 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, Chloride and Sulfate
The calibration for chloride and sulfate was performed using five calibration standards on June 12, 2012. The calibration curve correlation coefficient value was greater than 0.995 and the absolute value of the intercept was less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in seven verification checks. The calibration checks met the acceptance criteria.

Radium-226
Instrument calibration was performed in December 2011. Daily instrument checks met the acceptance criteria. The chemical recoveries met the acceptance criteria of 40 to 110 percent for all samples.

Radium-228
Instrument calibration was performed June 2012. Daily instrument checks met the acceptance criteria. The chemical recoveries met the acceptance criteria of 40 to 110 percent for all samples.

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 associated with the samples were below the PQLs for all analytes. The manganese method blank results were negative, with absolute values greater than the MDL, but less than the PQL. Associated sample results that are less than the PQL are qualified with a "J" flag as estimated values.

Radiochemistry
The radium-226 and radium-228 method blank results were below the DLC.

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 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. Spike samples were analyzed for manganese, molybdenum, sulfate, and uranium. The MS/MSD analyses resulted in acceptable recovery and precision for all analytes.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the non-radiochemical sample replicates and matrix spike replicates were less than 20 percent for results that were greater than 5 times the PQL, indicating acceptable precision. The radiochemical relative error ratio (calculated using the one-sigma total propagated uncertainty) for the laboratory control sample replicates 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 MDL. The manganese and

sodium serial recoveries from sample 0794 did not meet the acceptance criteria. The associated sample manganese and sodium results are qualified with a "J" flag as estimated values.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers. The analytical report included the MDL (MDC for radiochemistry) and PQL for all analytes and all required supporting documentation.

Chromatography Peak Integration

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

Electronic Data Deliverable (EDD) File

The EDD file was received on July 2, 2012. The Sample Management System EDD validation module was used to verify that the EDD files were complete and in compliance with requirements. The module compares the contents of the files to the requested analyses to ensure all and only the requested data are delivered. The original EDD file received was missing manganese data for samples 0405 and 0784. A revised file that included the missing data was received on July 7, 2012. 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: 12054590 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/26/2012

Project: Riverton **Analysis Type:** ☑ Metals ☑ General Chem ☑ Rad ☐ Organics

# of Samples: 40 **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	The reported detection limits are equal to or below contract requirements.
☑ Field/Trip Blanks	There was 1 trip/equipment blank evaluated.
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 12054590 **Lab Code:** PAR **Date Due:** 7/14/2012

Matrix: Water **Site Code:** RVT **Date Completed:** 7/9/2012

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								
Calcium	ICP/ES	06/25/2012	0.0000	1.0000	OK	OK	OK	OK	OK	96.0	99.0	99.0	0.0	109.0	3.0	106.0
Magnesium	ICP/ES	06/25/2012	0.0000	1.0000	OK	OK	OK	OK	OK	95.0	96.0	96.0	0.0	108.0	1.0	105.0
Manganese	ICP/ES	06/25/2012	0.0000	1.0000	OK	OK	OK	OK	OK	96.0	95.0	95.0	0.0	99.0	14.0	110.0
Manganese	ICP/ES	06/25/2012							OK	95.0	91.0	95.0	4.0			
Manganese	ICP/ES	06/25/2012									94.0	94.0	0.0			
Molybdenum	ICP/MS	06/27/2012	0.0000	1.0000	OK	OK	OK	OK		97.0	100.0	105.0	4.0	96.0	0.0	97.0
Molybdenum	ICP/MS	06/27/2012							OK	97.0	97.0	101.0	4.0			95.0
Molybdenum	ICP/MS	06/27/2012							OK		99.0	97.0	2.0			
Potassium	ICP/ES	06/25/2012	0.0000	1.0000	OK	OK	OK	OK	OK	94.0	101.0	100.0	1.0			82.0
Selenium	ICP/MS	06/27/2012	0.0000	1.0000	OK	OK	OK	OK	OK	98.0	103.0	105.0	3.0	100.0		80.0
Selenium	ICP/MS	06/27/2012							OK	99.0	100.0	104.0	4.0			87.0
Sodium	ICP/ES	06/25/2012	0.0000	1.0000	OK	OK	OK	OK	OK	95.0	101.0	100.0	1.0		11.0	85.0
Uranium	ICP/MS	06/27/2012	0.0000	1.0000	OK	OK	OK	OK	OK	99.0	103.0	107.0	4.0	99.0	3.0	90.0
Uranium	ICP/MS	06/27/2012							OK	100.0	104.0	106.0	1.0		7.0	95.0
Uranium	ICP/MS	06/27/2012									105.0	104.0	0.0			

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 12054590 **Lab Code:** PAR **Date Due:** 7/14/2012

Matrix: Water **Site Code:** RVT **Date Completed:** 7/9/2012

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
0822	Radium-226	06/26/2012			88.8			
Blank_Spike	Radium-226	06/26/2012			85.3	104.00		
Blank_Spike_Du	Radium-226	06/26/2012			90.2	113.00		0.50
Blank	Radium-226	06/26/2012	-0.0500	U	86.7			
0822	Radium-228	06/28/2012			95.9			
Blank_Spike	Radium-228	06/28/2012			98.1	101.00		
Blank_Spike_Du	Radium-228	06/28/2012			99.5	98.80		0.12
Blank	Radium-228	06/28/2012	-0.0160	U	97.9			

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 12054590 **Lab Code:** PAR **Date Due:** 7/14/2012

Matrix: Water **Site Code:** RVT **Date Completed:** 7/9/2012

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
CHLORIDE	06/19/2012	0.000	1.0000	OK	OK	OK	OK	OK	94.00				
Nitrate+Nitrite as N	06/22/2012	0.000	1.0000	OK	OK	OK	OK	OK	101.00	102.0	103.0	1.00	
SULFATE	06/19/2012	0.000	1.0000	OK	OK	OK	OK	OK	96.00	102.0	101.0	0	
SULFATE	06/19/2012							OK	95.00	102.0	99.0	1.00	
SULFATE	06/19/2012									102.0			
SULFATE	06/19/2012									99.0			

Sampling Quality Control Assessment

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

Sampling Protocol

Surface water locations were sampled using a peristaltic pump and tubing reel or by container immersion. Monitoring wells were sampled using a peristaltic pump and dedicated tubing. Domestic wells (0405, 0422, 0430, 0436, 0460, and 0828) were classified as Category IV and sampled by filling bottles at the discharge point.

Sample results for all monitoring wells met the Category I or II low-flow sampling criteria and were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. Wells 0705, 0719, and 0730 were classified as Category II and were further qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. One equipment blank was submitted with these samples. Manganese and uranium were detected in this blank. The manganese and uranium concentrations in the associated samples were greater than 10 times the blank concentration, not requiring qualification.

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. A duplicate sample was collected from location 0789. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results less than 5 times the PQL, the range should be no greater than the PQL. All duplicate results met these criteria demonstrating acceptable precision.

Only one field duplicate was collected during this sampling event, which did not meet the required frequency as noted on the *Water Sampling Field Activities Verification Checklist* and in the *Trip Report*; however, this does not pose a significant quality control concern because of the large number of field duplicate samples collected at LM sites that have been analyzed by the ALS Laboratory Group with acceptable precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 12054590 **Lab Code:** PAR **Project:** Riverton **Validation Date:** 7/26/2012

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1206236-40	SW6010	Manganese	0.19	B	0.11	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1206236-19	KGU 540	0747	150	1		
1206236-20	KGU 541	0749	85	1		
1206236-24	KGU 542	0794	16	1	E	
1206236-25	KGU 543	0796	14	1		
1206236-26	KGU 544	0810	37	1		
1206236-27	KGU 545	0811	53	1		
1206236-28	KGU 546	0812	24	1		
1206236-29	KGU 547	0822	14	1		
1206236-30	KGU 548	0823	170	1		

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1206236-40	SW6020	Uranium	0.028		0.0029	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1206236-19	KGU 540	0747	140	10		
1206236-20	KGU 541	0749	1.3	10		
1206236-24	KGU 542	0794	4.4	10		
1206236-25	KGU 543	0796	2.6	10		
1206236-26	KGU 544	0810	5.1	10		
1206236-27	KGU 545	0811	3.4	10		
1206236-28	KGU 546	0812	4	10		
1206236-29	KGU 547	0822	3.8	10		
1206236-30	KGU 548	0823	6.1	10		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 12054590 **Lab Code:** PAR **Project:** Riverton **Validation Date:** 7/26/2012

Duplicate: 2175 **Sample:** 0789

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	560			1	570			1	1.77		UG/L
Molybdenum	560			1	560			50	0		UG/L
Selenium	1.9			1	2			1	5.13		UG/L
SULFATE	5900			100	5800			100	1.71		MG/L
Uranium	2100			1	2300			50	9.09		UG/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 Donivan — Date: 9-21-2012

Data Validation Lead: Steve Donivan — Date: 9-21-2012

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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 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.

The manganese and sulfate results from location 0823 were identified as potentially anomalous. These data are acceptable as reported. There were no errors associated with the manganese data, and the sulfate concentration in well 0823 has been trending upward since 2009.

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: ALS Laboratory Group
RIN: 12054590
Report Date: 7/31/2012

					Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
RVT01	0705	0001	06/13/2012	Selenium	0.00028		FQ	0.03	UIW	F	0.001	U	GF	17	13	No
RVT01	0707	N001	06/13/2012	Selenium	0.00087		F	0.079		J	0.001	U	J	25	10	No
RVT01	0710	N001	06/12/2012	Selenium	0.00034		F	0.005	U		0.002	U		9	9	No
RVT01	0718	N001	06/13/2012	Manganese	0.26		F	3.28			0.35		F	28	0	No
RVT01	0718	N001	06/13/2012	Uranium	0.16		F	0.549			0.19		F	28	0	No
RVT01	0720	N001	06/13/2012	Selenium	0.0012		F	0.005	U		0.005	U		5	5	No
RVT01	0721	N001	06/13/2012	Manganese	0.0027	B	F	0.01	U		0.0029	B	F	22	2	No
RVT01	0723	N001	06/13/2012	Manganese	0.3		F	1.01			0.33		F	28	0	No
RVT01	0723	N001	06/13/2012	Selenium	0.0021		F	0.006	S		0.005	U	J	5	4	No
RVT01	0729	N001	06/12/2012	Molybdenum	0.002		F	0.01	U		0.0023	B		22	3	No
RVT01	0729	N001	06/12/2012	Uranium	0.0031		F	0.0186			0.0048		F	22	0	No
RVT01	0784	N001	06/12/2012	Molybdenum	0.0099		F	0.034		F	0.012		F	13	0	No
RVT01	0794	N001	06/12/2012	Selenium	0.00048	B		0.005	U	J	0.001	U	J	9	7	No
RVT01	0810	0001	06/12/2012	Sulfate	480			450			240			17	0	No
RVT01	0823	0001	06/12/2012	Manganese	0.17			0.068			0.0019	B		13	1	Yes
RVT01	0823	0001	06/12/2012	Molybdenum	0.0014			0.0063	E		0.0015			13	0	No
RVT01	0823	0001	06/12/2012	Sulfate	1100			920			230			15	0	Yes
RVT01	0824	N001	06/13/2012	Uranium	0.0085		F	0.02		F	0.0086		F	10	0	No
RVT01	0826	N001	06/13/2012	Molybdenum	0.02		F	0.0468		F	0.021		F	11	0	No

Data Validation Outliers Report - Field Parameters Only
Comparison: All Historical Data
Laboratory: Field Measurements
RIN: 12054590
Report Date: 7/31/2012

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current Result	Current Qualifiers Lab	Current Qualifiers Data	Historical Maximum Result	Historical Maximum Qualifiers Lab	Historical Maximum Qualifiers Data	Historical Minimum Result	Historical Minimum Qualifiers Lab	Historical Minimum Qualifiers Data	Number of Data Points N	Number of Data Points N Below Detect	Statistical Outlier
RVT01	0430	N001	06/12/2012	Turbidity	7.55			5.57			0.56		G	17	0	No
RVT01	0460	N001	06/12/2012	Alkalinity, Total (as $CaCO_3$)	149			194			157			12	0	No
RVT01	0719	N001	06/13/2012	Dissolved Oxygen	0.42		FQ	5.5		FQ	1.08		FQ	5	0	No
RVT01	0722R	N001	06/13/2012	Alkalinity, Total (as $CaCO_3$)	272		F	310		F	280		F	5	0	No
RVT01	0723	N001	06/13/2012	Alkalinity, Total (as $CaCO_3$)	263		F	604			306		F	26	0	No
RVT01	0729	N001	06/12/2012	Alkalinity, Total (as $CaCO_3$)	218		F	390		F	263		F	16	0	No
RVT01	0747	N001	06/13/2012	Temperature	29.52			27.1			2.14			23	0	No
RVT01	0784	N001	06/12/2012	Alkalinity, Total (as $CaCO_3$)	91		F	453		F	109		F	8	0	No
RVT01	0810	N001	06/12/2012	Turbidity	16.4			15.5			1.23			15	0	No
RVT01	0822	N001	06/13/2012	Alkalinity, Total (as $CaCO_3$)	154			430			178			12	0	No
RVT01	0823	N001	06/12/2012	Oxidation Reduction Potential	-77.1			231.9			22.2			15	0	No
RVT01	0823	N001	06/12/2012	Specific Conductance	2751			2408			777			15	0	No
RVT01	0823	N001	06/12/2012	Turbidity	62.3			34.4			1.81			14	0	No
RVT01	0828	N001	06/12/2012	Alkalinity, Total (as $CaCO_3$)	145			182			146			10	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.

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Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0405 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	-	113			#		
Dissolved Oxygen	mg/L	06/13/2012	N001	-	5.57			#		
Manganese	mg/L	06/13/2012	N001	-	0.0029	B		#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	-	0.003			#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	-	166.3			#		
pH	s.u.	06/13/2012	N001	-	8.55			#		
Selenium	mg/L	06/13/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	-	912			#		
Sulfate	mg/L	06/13/2012	N001	-	300			#	5	
Temperature	C	06/13/2012	N001	-	13.21			#		
Turbidity	NTU	06/13/2012	N001	-	3.7			#		
Uranium	mg/L	06/13/2012	N001	-	0.000043			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0422 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	168			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	5.31			#		
Manganese	mg/L	06/12/2012	N001	-	0.00011	U		#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.0012			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	91.3			#		
pH	s.u.	06/12/2012	N001	-	7.6			#		
Selenium	mg/L	06/12/2012	N001	-	0.00035			#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	524			#		
Sulfate	mg/L	06/12/2012	N001	-	89			#	2.5	
Temperature	C	06/12/2012	N001	-	14.58			#		
Turbidity	NTU	06/12/2012	N001	-	2.68			#		
Uranium	mg/L	06/12/2012	N001	-	0.0024			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0430 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	147			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	3.33			#		
Manganese	mg/L	06/12/2012	N001	-	0.0027	B		#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.0021			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	35.6			#		
pH	s.u.	06/12/2012	N001	-	8.6			#		
Selenium	mg/L	06/12/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	781			#		
Sulfate	mg/L	06/12/2012	N001	-	180			#	2.5	
Temperature	C	06/12/2012	N001	-	14.26			#		
Turbidity	NTU	06/12/2012	N001	-	7.55			#		
Uranium	mg/L	06/12/2012	N001	-	0.00003			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0436 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	167			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	2.54			#		
Manganese	mg/L	06/12/2012	N001	-	0.0018	B		#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.0029			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	106.7			#		
pH	s.u.	06/12/2012	N001	-	8.35			#		
Selenium	mg/L	06/12/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	832			#		
Sulfate	mg/L	06/12/2012	N001	-	210			#	2.5	
Temperature	C	06/12/2012	N001	-	23.13			#		
Turbidity	NTU	06/12/2012	N001	-	4.5			#		
Uranium	mg/L	06/12/2012	N001	-	0.00007			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0460 WELL Koch Sulfuric Acid Plant

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	149			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	3.05			#		
Manganese	mg/L	06/12/2012	N001	-	0.00084	B		#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.0026			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	136.4			#		
pH	s.u.	06/12/2012	N001	-	8.77			#		
Selenium	mg/L	06/12/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	747			#		
Sulfate	mg/L	06/12/2012	N001	-	160			#	2.5	
Temperature	C	06/12/2012	N001	-	20.39			#		
Turbidity	NTU	06/12/2012	N001	-	2.97			#		
Uranium	mg/L	06/12/2012	N001	-	0.000053			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0705 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	0001	37.3	-	61.8	65		FQ	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	37.3	-	61.8	3.21		FQ	#		
Manganese	mg/L	06/13/2012	0001	37.3	-	61.8	0.00011	U	FQ	#	0.00011	
Molybdenum	mg/L	06/13/2012	0001	37.3	-	61.8	0.0029		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	37.3	-	61.8	54.1		FQ	#		
pH	s.u.	06/13/2012	N001	37.3	-	61.8	8.14		FQ	#		
Selenium	mg/L	06/13/2012	0001	37.3	-	61.8	0.00028		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	37.3	-	61.8	1303		FQ	#		
Sulfate	mg/L	06/13/2012	0001	37.3	-	61.8	460		FQ	#	10	
Temperature	C	06/13/2012	N001	37.3	-	61.8	11.4		FQ	#		
Turbidity	NTU	06/13/2012	N001	37.3	-	61.8	67.1		FQ	#		
Uranium	mg/L	06/13/2012	0001	37.3	-	61.8	0.00044		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0707 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	9.1	-	23.3	333		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	9.1	-	23.3	0.29		F	#		
Manganese	mg/L	06/13/2012	N001	9.1	-	23.3	1.2		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	9.1	-	23.3	0.9		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	9.1	-	23.3	96.6		F	#		
pH	s.u.	06/13/2012	N001	9.1	-	23.3	6.83		F	#		
Selenium	mg/L	06/13/2012	N001	9.1	-	23.3	0.00087		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	9.1	-	23.3	5688		F	#		
Sulfate	mg/L	06/13/2012	N001	9.1	-	23.3	3100		F	#	25	
Temperature	C	06/13/2012	N001	9.1	-	23.3	10.76		F	#		
Turbidity	NTU	06/13/2012	N001	9.1	-	23.3	6.37		F	#		
Uranium	mg/L	06/13/2012	N001	9.1	-	23.3	1		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0710 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	9.8 - 26.8	197		F	#		
Dissolved Oxygen	mg/L	06/12/2012	N001	9.8 - 26.8	1.07		F	#		
Manganese	mg/L	06/12/2012	N001	9.8 - 26.8	0.014		F	#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	9.8 - 26.8	0.0013		F	#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	9.8 - 26.8	84.7		F	#		
pH	s.u.	06/12/2012	N001	9.8 - 26.8	7.08		F	#		
Selenium	mg/L	06/12/2012	N001	9.8 - 26.8	0.00034		F	#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	9.8 - 26.8	908		F	#		
Sulfate	mg/L	06/12/2012	N001	9.8 - 26.8	250		F	#	2.5	
Temperature	C	06/12/2012	N001	9.8 - 26.8	10.07		F	#		
Turbidity	NTU	06/12/2012	N001	9.8 - 26.8	5.9		F	#		
Uranium	mg/L	06/12/2012	N001	9.8 - 26.8	0.0053		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0716 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	9.78 - 14.78	276		F	#		
Dissolved Oxygen	mg/L	06/12/2012	N001	9.78 - 14.78	0.43		F	#		
Manganese	mg/L	06/12/2012	N001	9.78 - 14.78	0.17		F	#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	9.78 - 14.78	0.13		F	#	0.00032	
Oxidation Reduction Potential	mV	06/12/2012	N001	9.78 - 14.78	36.6		F	#		
pH	s.u.	06/12/2012	N001	9.78 - 14.78	6.9		F	#		
Selenium	mg/L	06/12/2012	N001	9.78 - 14.78	0.0015		F	#	0.00032	
Specific Conductance	umhos /cm	06/12/2012	N001	9.78 - 14.78	1534		F	#		
Sulfate	mg/L	06/12/2012	N001	9.78 - 14.78	460		F	#	10	
Temperature	C	06/12/2012	N001	9.78 - 14.78	12.9		F	#		
Turbidity	NTU	06/12/2012	N001	9.78 - 14.78	5.34		F	#		
Uranium	mg/L	06/12/2012	N001	9.78 - 14.78	0.3		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0717 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	45.1	-	55.1	194		F	#		
Dissolved Oxygen	mg/L	06/12/2012	N001	45.1	-	55.1	0.29		F	#		
Manganese	mg/L	06/12/2012	N001	45.1	-	55.1	0.21		F	#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	45.1	-	55.1	0.0091		F	#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	45.1	-	55.1	-71.1		F	#		
pH	s.u.	06/12/2012	N001	45.1	-	55.1	7.52		F	#		
Selenium	mg/L	06/12/2012	N001	45.1	-	55.1	0.0015		F	#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	45.1	-	55.1	1927		F	#		
Sulfate	mg/L	06/12/2012	N001	45.1	-	55.1	720		F	#	10	
Temperature	C	06/12/2012	N001	45.1	-	55.1	12.7		F	#		
Turbidity	NTU	06/12/2012	N001	45.1	-	55.1	5.58		F	#		
Uranium	mg/L	06/12/2012	N001	45.1	-	55.1	0.000065		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0718 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	18.24	-	23.24	349		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	18.24	-	23.24	0.42		F	#		
Manganese	mg/L	06/13/2012	N001	18.24	-	23.24	0.26		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	18.24	-	23.24	0.068		F	#	0.00016	
Oxidation Reduction Potential	mV	06/13/2012	N001	18.24	-	23.24	133.5		F	#		
pH	s.u.	06/13/2012	N001	18.24	-	23.24	6.94		F	#		
Selenium	mg/L	06/13/2012	N001	18.24	-	23.24	0.005		F	#	0.00016	
Specific Conductance	umhos /cm	06/13/2012	N001	18.24	-	23.24	5120		F	#		
Sulfate	mg/L	06/13/2012	N001	18.24	-	23.24	2600		F	#	25	
Temperature	C	06/13/2012	N001	18.24	-	23.24	15.04		F	#		
Turbidity	NTU	06/13/2012	N001	18.24	-	23.24	6.57		F	#		
Uranium	mg/L	06/13/2012	N001	18.24	-	23.24	0.16		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0719 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	38.47	-	48.47	99		FQ	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	38.47	-	48.47	0.42		FQ	#		
Manganese	mg/L	06/13/2012	N001	38.47	-	48.47	0.064		FQ	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	38.47	-	48.47	0.013		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	38.47	-	48.47	-92.4		FQ	#		
pH	s.u.	06/13/2012	N001	38.47	-	48.47	7.53		FQ	#		
Selenium	mg/L	06/13/2012	N001	38.47	-	48.47	0.00069		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	38.47	-	48.47	1236		FQ	#		
Sulfate	mg/L	06/13/2012	N001	38.47	-	48.47	450		FQ	#	10	
Temperature	C	06/13/2012	N001	38.47	-	48.47	14.89		FQ	#		
Turbidity	NTU	06/13/2012	N001	38.47	-	48.47	7.56		FQ	#		
Uranium	mg/L	06/13/2012	N001	38.47	-	48.47	0.00054		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0720 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	7.94 - 12.94	227		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	7.94 - 12.94	0.9		F	#		
Manganese	mg/L	06/13/2012	N001	7.94 - 12.94	0.0015	B	F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	7.94 - 12.94	0.0013		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	7.94 - 12.94	79.3		F	#		
pH	s.u.	06/13/2012	N001	7.94 - 12.94	7.08		F	#		
Selenium	mg/L	06/13/2012	N001	7.94 - 12.94	0.0012		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	7.94 - 12.94	812		F	#		
Sulfate	mg/L	06/13/2012	N001	7.94 - 12.94	190		F	#	2.5	
Temperature	C	06/13/2012	N001	7.94 - 12.94	10.57		F	#		
Turbidity	NTU	06/13/2012	N001	7.94 - 12.94	1.74		F	#		
Uranium	mg/L	06/13/2012	N001	7.94 - 12.94	0.0063		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0721 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	44.43	-	54.43	98		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	44.43	-	54.43	0.19		F	#		
Manganese	mg/L	06/13/2012	N001	44.43	-	54.43	0.0027	B	F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	44.43	-	54.43	0.0025		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	44.43	-	54.43	-28		F	#		
pH	s.u.	06/13/2012	N001	44.43	-	54.43	8.53		F	#		
Selenium	mg/L	06/13/2012	N001	44.43	-	54.43	0.000032	U	F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	44.43	-	54.43	895		F	#		
Sulfate	mg/L	06/13/2012	N001	44.43	-	54.43	280		F	#	2.5	
Temperature	C	06/13/2012	N001	44.43	-	54.43	10.14		F	#		
Turbidity	NTU	06/13/2012	N001	44.43	-	54.43	2.12		F	#		
Uranium	mg/L	06/13/2012	N001	44.43	-	54.43	0.000091		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0722R WELL Replacement well for destroyed well 0722.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	11.1	-	16.1	272		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	11.1	-	16.1	0.57		F	#		
Manganese	mg/L	06/13/2012	N001	11.1	-	16.1	0.0034	B	F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	11.1	-	16.1	0.13		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	11.1	-	16.1	42.6		F	#		
pH	s.u.	06/13/2012	N001	11.1	-	16.1	6.75		F	#		
Selenium	mg/L	06/13/2012	N001	11.1	-	16.1	0.0014		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	11.1	-	16.1	2072		F	#		
Sulfate	mg/L	06/13/2012	N001	11.1	-	16.1	840		F	#	10	
Temperature	C	06/13/2012	N001	11.1	-	16.1	13.44		F	#		
Turbidity	NTU	06/13/2012	N001	11.1	-	16.1	1.17		F	#		
Uranium	mg/L	06/13/2012	N001	11.1	-	16.1	0.51		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0723 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	45.99 - 55.99	263		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	45.99 - 55.99	0.31		F	#		
Manganese	mg/L	06/13/2012	N001	45.99 - 55.99	0.3		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	45.99 - 55.99	0.00029		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	45.99 - 55.99	-60		F	#		
pH	s.u.	06/13/2012	N001	45.99 - 55.99	7.05		F	#		
Selenium	mg/L	06/13/2012	N001	45.99 - 55.99	0.0021		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	45.99 - 55.99	3505		F	#		
Sulfate	mg/L	06/13/2012	N001	45.99 - 55.99	1600		F	#	25	
Temperature	C	06/13/2012	N001	45.99 - 55.99	13.2		F	#		
Turbidity	NTU	06/13/2012	N001	45.99 - 55.99	1.45		F	#		
Uranium	mg/L	06/13/2012	N001	45.99 - 55.99	0.000045		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0729 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	14.71	-	19.71	218		F	#		
Dissolved Oxygen	mg/L	06/12/2012	N001	14.71	-	19.71	1.02		F	#		
Manganese	mg/L	06/12/2012	N001	14.71	-	19.71	0.0021	B	F	#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	14.71	-	19.71	0.002		F	#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	14.71	-	19.71	136.2		F	#		
pH	s.u.	06/12/2012	N001	14.71	-	19.71	6.85		F	#		
Selenium	mg/L	06/12/2012	N001	14.71	-	19.71	0.00047		F	#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	14.71	-	19.71	623		F	#		
Sulfate	mg/L	06/12/2012	N001	14.71	-	19.71	74		F	#	2.5	
Temperature	C	06/12/2012	N001	14.71	-	19.71	13.77		F	#		
Turbidity	NTU	06/12/2012	N001	14.71	-	19.71	2.18		F	#		
Uranium	mg/L	06/12/2012	N001	14.71	-	19.71	0.0031		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0730 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	38.62	-	48.62	323		FQ	#		
Dissolved Oxygen	mg/L	06/12/2012	N001	38.62	-	48.62	0.58		FQ	#		
Manganese	mg/L	06/12/2012	N001	38.62	-	48.62	0.048		FQ	#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	38.62	-	48.62	0.0042		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	38.62	-	48.62	-14.2		FQ	#		
pH	s.u.	06/12/2012	N001	38.62	-	48.62	7.15		FQ	#		
Selenium	mg/L	06/12/2012	N001	38.62	-	48.62	0.00014		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	38.62	-	48.62	963		FQ	#		
Sulfate	mg/L	06/12/2012	N001	38.62	-	48.62	150		FQ	#	2.5	
Temperature	C	06/12/2012	N001	38.62	-	48.62	13.07		FQ	#		
Turbidity	NTU	06/12/2012	N001	38.62	-	48.62	5.74		FQ	#		
Uranium	mg/L	06/12/2012	N001	38.62	-	48.62	0.0074		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0784 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	1.65 - 6.65	91		F	#		
Dissolved Oxygen	mg/L	06/12/2012	N001	1.65 - 6.65	0.29		F	#		
Manganese	mg/L	06/12/2012	N001	1.65 - 6.65	0.71		F	#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	1.65 - 6.65	0.0099		F	#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	1.65 - 6.65	32.8		F	#		
pH	s.u.	06/12/2012	N001	1.65 - 6.65	7.39		F	#		
Selenium	mg/L	06/12/2012	N001	1.65 - 6.65	0.00048		F	#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	1.65 - 6.65	4158		F	#		
Sulfate	mg/L	06/12/2012	N001	1.65 - 6.65	2300		F	#	25	
Temperature	C	06/12/2012	N001	1.65 - 6.65	13.69		F	#		
Turbidity	NTU	06/12/2012	N001	1.65 - 6.65	3.2		F	#		
Uranium	mg/L	06/12/2012	N001	1.65 - 6.65	0.0028		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0788 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	1.41	-	13.41	433		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	1.41	-	13.41	0.36		F	#		
Manganese	mg/L	06/13/2012	N001	1.41	-	13.41	0.29		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	1.41	-	13.41	0.022		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	1.41	-	13.41	114.5		F	#		
pH	s.u.	06/13/2012	N001	1.41	-	13.41	7.07		F	#		
Selenium	mg/L	06/13/2012	N001	1.41	-	13.41	0.00026		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	1.41	-	13.41	3708		F	#		
Sulfate	mg/L	06/13/2012	N001	1.41	-	13.41	1700		F	#	25	
Temperature	C	06/13/2012	N001	1.41	-	13.41	10.29		F	#		
Turbidity	NTU	06/13/2012	N001	1.41	-	13.41	5.74		F	#		
Uranium	mg/L	06/13/2012	N001	1.41	-	13.41	0.053		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0789 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	6.2	-	18.2	450		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	6.2	-	18.2	0.45		F	#		
Manganese	mg/L	06/13/2012	N001	6.2	-	18.2	0.56		F	#	0.00011	
Manganese	mg/L	06/13/2012	N002	6.2	-	18.2	0.57		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	6.2	-	18.2	0.56		F	#	0.000032	
Molybdenum	mg/L	06/13/2012	N002	6.2	-	18.2	0.56		F	#	0.0016	
Oxidation Reduction Potential	mV	06/13/2012	N001	6.2	-	18.2	134.7		F	#		
pH	s.u.	06/13/2012	N001	6.2	-	18.2	6.96		F	#		
Selenium	mg/L	06/13/2012	N001	6.2	-	18.2	0.0019		F	#	0.000032	
Selenium	mg/L	06/13/2012	N002	6.2	-	18.2	0.002		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	6.2	-	18.2	10389		F	#		
Sulfate	mg/L	06/13/2012	N001	6.2	-	18.2	5900		F	#	50	
Sulfate	mg/L	06/13/2012	N002	6.2	-	18.2	5800		F	#	50	
Temperature	C	06/13/2012	N001	6.2	-	18.2	11.62		F	#		
Turbidity	NTU	06/13/2012	N001	6.2	-	18.2	4.02		F	#		
Uranium	mg/L	06/13/2012	N001	6.2	-	18.2	2.1		F	#	0.0000029	
Uranium	mg/L	06/13/2012	N002	6.2	-	18.2	2.3		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0824 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	9.5	-	14.5	219		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	9.5	-	14.5	3.57		F	#		
Manganese	mg/L	06/13/2012	N001	9.5	-	14.5	0.0078		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	9.5	-	14.5	0.0047		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	9.5	-	14.5	118.4		F	#		
pH	s.u.	06/13/2012	N001	9.5	-	14.5	7.05		F	#		
Selenium	mg/L	06/13/2012	N001	9.5	-	14.5	0.00093		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	9.5	-	14.5	652		F	#		
Sulfate	mg/L	06/13/2012	N001	9.5	-	14.5	85		F	#	2.5	
Temperature	C	06/13/2012	N001	9.5	-	14.5	12		F	#		
Turbidity	NTU	06/13/2012	N001	9.5	-	14.5	8.17		F	#		
Uranium	mg/L	06/13/2012	N001	9.5	-	14.5	0.0085		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0826 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	6.6	-	11.6	382		F	#		
Dissolved Oxygen	mg/L	06/13/2012	N001	6.6	-	11.6	0.38		F	#		
Manganese	mg/L	06/13/2012	N001	6.6	-	11.6	2.9		F	#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	6.6	-	11.6	0.02		F	#	0.000032	
Oxidation Reduction Potential	mV	06/13/2012	N001	6.6	-	11.6	65.4		F	#		
pH	s.u.	06/13/2012	N001	6.6	-	11.6	6.96		F	#		
Selenium	mg/L	06/13/2012	N001	6.6	-	11.6	0.00025		F	#	0.000032	
Specific Conductance	umhos /cm	06/13/2012	N001	6.6	-	11.6	3679		F	#		
Sulfate	mg/L	06/13/2012	N001	6.6	-	11.6	1800		F	#	25	
Temperature	C	06/13/2012	N001	6.6	-	11.6	9.98		F	#		
Turbidity	NTU	06/13/2012	N001	6.6	-	11.6	4.25		F	#		
Uranium	mg/L	06/13/2012	N001	6.6	-	11.6	0.049		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0828 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	145			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	4.56			#		
Manganese	mg/L	06/12/2012	N001	-	0.00011	U		#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.0028			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	94.2			#		
pH	s.u.	06/12/2012	N001	-	8.64			#		
Selenium	mg/L	06/12/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	837			#		
Sulfate	mg/L	06/12/2012	N001	-	210			#	2.5	
Temperature	C	06/12/2012	N001	-	18.08			#		
Turbidity	NTU	06/12/2012	N001	-	4.3			#		
Uranium	mg/L	06/12/2012	N001	-	0.00015			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0838 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/11/2012	N001	-	152			#		
Dissolved Oxygen	mg/L	06/11/2012	N001	-	10.29			#		
Manganese	mg/L	06/11/2012	N001	-	0.24			#	0.00011	
Molybdenum	mg/L	06/11/2012	N001	-	0.003			#	0.000032	
Oxidation Reduction Potential	mV	06/11/2012	N001	-	237.9			#		
pH	s.u.	06/11/2012	N001	-	7.41			#		
Selenium	mg/L	06/11/2012	N001	-	0.000045	B		#	0.000032	
Specific Conductance	umhos /cm	06/11/2012	N001	-	855			#		
Sulfate	mg/L	06/11/2012	N001	-	220			#	2.5	
Temperature	C	06/11/2012	N001	-	13.11			#		
Turbidity	NTU	06/11/2012	N001	-	4.66			#		
Uranium	mg/L	06/11/2012	N001	-	0.0024			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0839 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/11/2012	N001	-	173			#		
Dissolved Oxygen	mg/L	06/11/2012	N001	-	6.42			#		
Manganese	mg/L	06/11/2012	N001	-	0.16			#	0.00011	
Molybdenum	mg/L	06/11/2012	N001	-	0.0032			#	0.000032	
Oxidation Reduction Potential	mV	06/11/2012	N001	-	57.3			#		
pH	s.u.	06/11/2012	N001	-	7.73			#		
Selenium	mg/L	06/11/2012	N001	-	0.000046	B		#	0.000032	
Specific Conductance	umhos /cm	06/11/2012	N001	-	1400			#		
Sulfate	mg/L	06/11/2012	N001	-	460			#	10	
Temperature	C	06/11/2012	N001	-	12.71			#		
Turbidity	NTU	06/11/2012	N001	-	1.75			#		
Uranium	mg/L	06/11/2012	N001	-	0.00045			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0840 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/11/2012	N001	-	180			#		
Dissolved Oxygen	mg/L	06/11/2012	N001	-	11.38			#		
Manganese	mg/L	06/11/2012	N001	-	0.079			#	0.00011	
Molybdenum	mg/L	06/11/2012	N001	-	0.0034			#	0.000032	
Oxidation Reduction Potential	mV	06/11/2012	N001	-	119.4			#		
pH	s.u.	06/11/2012	N001	-	7.74			#		
Selenium	mg/L	06/11/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/11/2012	N001	-	833			#		
Sulfate	mg/L	06/11/2012	N001	-	220			#	2.5	
Temperature	C	06/11/2012	N001	-	14.39			#		
Turbidity	NTU	06/11/2012	N001	-	3.34			#		
Uranium	mg/L	06/11/2012	N001	-	0.0011			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0841 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	185			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	4.46			#		
Manganese	mg/L	06/12/2012	N001	-	0.11			#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.003			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	105.4			#		
pH	s.u.	06/12/2012	N001	-	7.49			#		
Selenium	mg/L	06/12/2012	N001	-	0.00014			#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	900			#		
Sulfate	mg/L	06/12/2012	N001	-	240			#	2.5	
Temperature	C	06/12/2012	N001	-	14.91			#		
Turbidity	NTU	06/12/2012	N001	-	1.78			#		
Uranium	mg/L	06/12/2012	N001	-	0.0029			#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0842 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	-	138			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	-	4.53			#		
Manganese	mg/L	06/12/2012	N001	-	0.056			#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	-	0.0023			#	0.000032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-	-8.2			#		
pH	s.u.	06/12/2012	N001	-	7.69			#		
Selenium	mg/L	06/12/2012	N001	-	0.000032	U		#	0.000032	
Specific Conductance	umhos /cm	06/12/2012	N001	-	728			#		
Sulfate	mg/L	06/12/2012	N001	-	170			#	2.5	
Temperature	C	06/12/2012	N001	-	13.94			#		
Turbidity	NTU	06/12/2012	N001	-	1.84			#		
Uranium	mg/L	06/12/2012	N001	-	0.00047			#	0.0000029	

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.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0747 SURFACE LOCATION 8/26/97 State plane east changed from 594497.14 to an estimation close to river

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	0001	311			#		
Dissolved Oxygen	mg/L	06/13/2012	N001	8.12			#		
Manganese	mg/L	06/13/2012	0001	0.15			#	0.00011	
Molybdenum	mg/L	06/13/2012	0001	0.013			#	0.00032	
Oxidation Reduction Potential	mV	06/13/2012	N001	-6.3			#		
pH	s.u.	06/13/2012	N001	8.03			#		
Specific Conductance	umhos/cm	06/13/2012	N001	2658			#		
Sulfate	mg/L	06/13/2012	0001	1100			#	25	
Temperature	C	06/13/2012	N001	29.52			#		
Turbidity	NTU	06/13/2012	N001	79.1			#		
Uranium	mg/L	06/13/2012	0001	0.14			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0749 SURFACE LOCATION 8/26/97 State plane east changed from 589532.71 to an estimation close to river

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	N001	37			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	6.76			#		
Manganese	mg/L	06/12/2012	N001	0.085			#	0.00011	
Molybdenum	mg/L	06/12/2012	N001	0.0085			#	0.00032	
Oxidation Reduction Potential	mV	06/12/2012	N001	74.5			#		
pH	s.u.	06/12/2012	N001	7.33			#		
Specific Conductance	umhos/cm	06/12/2012	N001	3536			#		
Sulfate	mg/L	06/12/2012	N001	2000			#	25	
Temperature	C	06/12/2012	N001	24.85			#		
Turbidity	NTU	06/12/2012	N001	9.98			#		
Uranium	mg/L	06/12/2012	N001	0.0013			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0794 SURFACE LOCATION 8/26/97 State plane north changed from 844178.27 to an estimation close to river

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	0001	116			#		
Calcium	mg/L	06/12/2012	0001	48			#	0.012	
Chloride	mg/L	06/12/2012	0001	3.8			#	1	
Dissolved Oxygen	mg/L	06/12/2012	N001	8.97			#		
Magnesium	mg/L	06/12/2012	0001	16			#	0.013	
Manganese	mg/L	06/12/2012	0001	0.016	E	J	#	0.00011	
Molybdenum	mg/L	06/12/2012	0001	0.0011			#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2012	0001	0.014			#	0.01	
Oxidation Reduction Potential	mV	06/12/2012	N001	101.9			#		
pH	s.u.	06/12/2012	N001	7.99			#		
Potassium	mg/L	06/12/2012	0001	1.7			#	0.11	
Selenium	mg/L	06/12/2012	N001	0.00048	B		#	0.00032	
Sodium	mg/L	06/12/2012	0001	24	E	J	#	0.0066	
Specific Conductance	umhos/cm	06/12/2012	N001	481			#		
Sulfate	mg/L	06/12/2012	0001	120			#	2.5	
Temperature	C	06/12/2012	N001	19.71			#		
Turbidity	NTU	06/12/2012	N001	17.9			#		
Uranium	mg/L	06/12/2012	0001	0.0044			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0796 SURFACE LOCATION Was possibly historically sampled ~900 ft E from current location

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	0001	102			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	7.73			#		
Manganese	mg/L	06/12/2012	0001	0.014			#	0.00011	
Molybdenum	mg/L	06/12/2012	0001	0.00097	B		#	0.00032	
Oxidation Reduction Potential	mV	06/12/2012	N001	225.3			#		
pH	s.u.	06/12/2012	N001	8.13			#		
Specific Conductance	umhos/cm	06/12/2012	N001	435			#		
Sulfate	mg/L	06/12/2012	0001	110			#	1	
Temperature	C	06/12/2012	N001	14.53			#		
Turbidity	NTU	06/12/2012	N001	25.8			#		
Uranium	mg/L	06/12/2012	0001	0.0026			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0810 SURFACE LOCATION Gravel Pit Pond

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	0001	370			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	9.22			#		
Manganese	mg/L	06/12/2012	0001	0.037			#	0.00011	
Molybdenum	mg/L	06/12/2012	0001	0.001			#	0.00032	
Oxidation Reduction Potential	mV	06/12/2012	N001	98.1			#		
pH	s.u.	06/12/2012	N001	8.83			#		
Specific Conductance	umhos/cm	06/12/2012	N001	1694			#		
Sulfate	mg/L	06/12/2012	0001	480			#	10	
Temperature	C	06/12/2012	N001	23.7			#		
Turbidity	NTU	06/12/2012	N001	16.4			#		
Uranium	mg/L	06/12/2012	0001	0.0051			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0811 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	0001	108			#		
Dissolved Oxygen	mg/L	06/13/2012	N001	8.53			#		
Manganese	mg/L	06/13/2012	0001	0.053			#	0.00011	
Molybdenum	mg/L	06/13/2012	0001	0.0011			#	0.00032	
Oxidation Reduction Potential	mV	06/13/2012	N001	84			#		
pH	s.u.	06/13/2012	N001	8.34			#		
Specific Conductance	umhos/cm	06/13/2012	N001	504			#		
Sulfate	mg/L	06/13/2012	0001	130			#	2.5	
Temperature	C	06/13/2012	N001	21.54			#		
Turbidity	NTU	06/13/2012	N001	89.7			#		
Uranium	mg/L	06/13/2012	0001	0.0034			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0812 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	0001	108			#		
Dissolved Oxygen	mg/L	06/13/2012	N001	8.9			#		
Manganese	mg/L	06/13/2012	0001	0.024			#	0.00011	
Molybdenum	mg/L	06/13/2012	0001	0.0012			#	0.00032	
Oxidation Reduction Potential	mV	06/13/2012	N001	24.4			#		
pH	s.u.	06/13/2012	N001	8.58			#		
Specific Conductance	umhos/cm	06/13/2012	N001	418			#		
Sulfate	mg/L	06/13/2012	0001	130			#	2.5	
Temperature	C	06/13/2012	N001	25.62			#		
Turbidity	NTU	06/13/2012	N001	51.4			#		
Uranium	mg/L	06/13/2012	0001	0.004			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0822 SURFACE LOCATION west-side irrigation ditch

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/13/2012	N001	154			#		
Dissolved Oxygen	mg/L	06/13/2012	N001	8.97			#		
Manganese	mg/L	06/13/2012	N001	0.014			#	0.00011	
Molybdenum	mg/L	06/13/2012	N001	0.0039			#	0.00032	
Oxidation Reduction Potential	mV	06/13/2012	N001	79.2			#		
pH	s.u.	06/13/2012	N001	7.87			#		
Radium-226	pCi/L	06/13/2012	N001	0.25	U		#	0.25	0.192
Radium-228	pCi/L	06/13/2012	N001	0.443		J	#	0.32	0.233
Specific Conductance	umhos/cm	06/13/2012	N001	2021			#		
Sulfate	mg/L	06/13/2012	N001	960			#	10	
Temperature	C	06/13/2012	N001	16.26			#		
Turbidity	NTU	06/13/2012	N001	2.76			#		
Uranium	mg/L	06/13/2012	N001	0.0038			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012
Location: 0823 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/12/2012	0001	108			#		
Dissolved Oxygen	mg/L	06/12/2012	N001	8.85			#		
Manganese	mg/L	06/12/2012	0001	0.17			#	0.00011	
Molybdenum	mg/L	06/12/2012	0001	0.0014			#	0.00032	
Oxidation Reduction Potential	mV	06/12/2012	N001	-77.1			#		
pH	s.u.	06/12/2012	N001	7.97			#		
Specific Conductance	umhos/cm	06/12/2012	N001	2751			#		
Sulfate	mg/L	06/12/2012	0001	1100			#	25	
Temperature	C	06/12/2012	N001	21.33			#		
Turbidity	NTU	06/12/2012	N001	62.3			#		
Uranium	mg/L	06/12/2012	0001	0.0061			#	0.000029	

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.

Equipment Blank Data

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BLANKS REPORT
LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 12054590
Report Date: 7/31/2012

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Manganese	RVT01	0999	06/13/2012	N001	mg/L	0.00019	B		0.00011		E
Molybdenum	RVT01	0999	06/13/2012	N001	mg/L	0.000032	U		0.000032		E
Selenium	RVT01	0999	06/13/2012	N001	mg/L	0.000032	U		0.000032		E
Sulfate	RVT01	0999	06/13/2012	N001	mg/L	0.5	U		0.5		E
Uranium	RVT01	0999	06/13/2012	N001	mg/L	0.000028			0.0000029		E

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.

SAMPLE TYPES:
- E Equipment Blank.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0101	O	4946.58	06/12/2012	10:11:00	9.92	4936.66
0110	O	4950.19	06/12/2012	09:48:00	12.35	4932
0111	O	4946.87	06/12/2012	09:59:00	9.05	4937.82
0700	U	4951.38	06/12/2012	14:18:00	6.35	4945.03
0702	D	4931	06/13/2012	15:21:00	6.16	4924.84
0705	D	4930.8	06/13/2012	15:40:04	6.32	4924.48
0707	D	4931	06/13/2012	16:00:28	5.41	4925.59
0709	D	4930.7	06/12/2012	17:28:00	3.02	4927.68
0710	U	4947.9	06/12/2012	16:50:16	5.44	4942.46
0716	O	4939.12	06/12/2012	11:55:16	8.99	4930.13
0717	O	4938.8	06/12/2012	11:45:42	8.63	4930.17
0718	D	4937.6	06/13/2012	13:50:13	7.93	4929.67
0719	D	4937.55	06/13/2012	14:10:49	7.5	4930.05
0720	C	4940.46	06/13/2012	09:20:06	5.31	4935.15
0721	C	4940.47	06/13/2012	09:00:02	7.91	4932.56
0722R		4937.06	06/13/2012	17:15:09	9.39	4927.67
0723	D	4936.01	06/13/2012	16:55:22	8.12	4927.89
0724	U	4941.36	06/12/2012	11:08:00	6.29	4935.07
0725	U	4941.66	06/12/2012	11:00:00	6.47	4935.19
0726	U	4942	06/12/2012	11:07:00	6.3	4935.7
0727	U	4951.69	06/12/2012	10:55:00	9.26	4942.43
0728	U	4946.01	06/12/2012	10:56:00	6.79	4939.22
0729	D	4932.75	06/12/2012	16:00:06	3.15	4929.6
0730	D	4933.08	06/12/2012	16:10:41	4.98	4928.1
0732	U	4945.07	06/12/2012	11:10:00	8.05	4937.02
0733	U	4946.76	06/12/2012	12:31:00	5.45	4941.31
0734	U	4946.08	06/12/2012	14:16:00	7.16	4938.92
0736	U	4946	06/12/2012	16:25:00	7.14	4938.86

STATIC WATER LEVELS (USEE700) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 7/31/2012

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0784	U	4945.45	06/12/2012	12:45:56	6.81	4938.64
0788	C	4935.09	06/13/2012	10:50:42	8.34	4926.75
0789	D	4933.66	06/13/2012	11:25:03	8.65	4925.01
0824		4928.27	06/13/2012	18:25:56	4.98	4923.29
0826		4936.98	06/13/2012	10:20:05	7.3	4929.68

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

Time-Concentration Graphs

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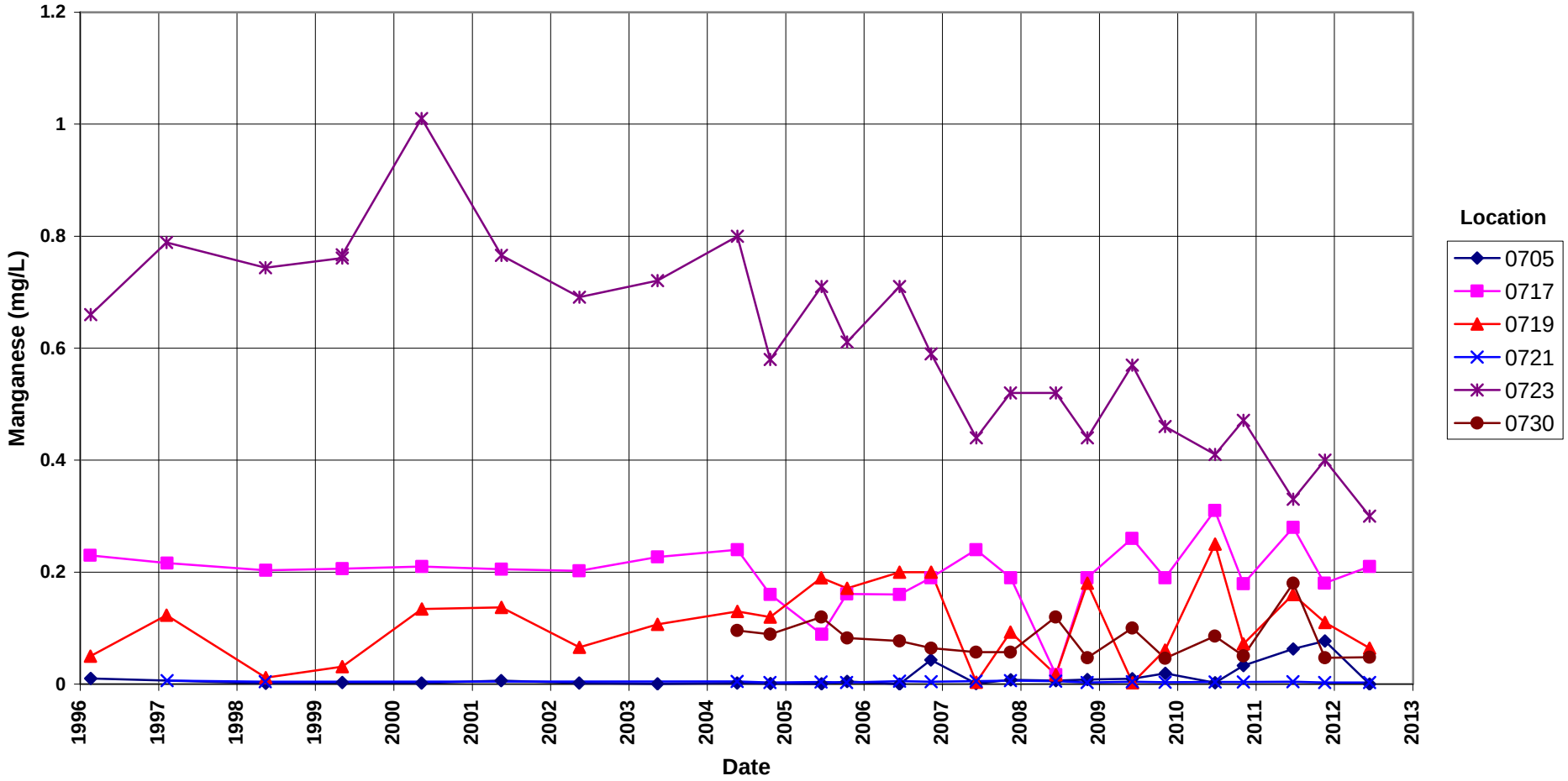
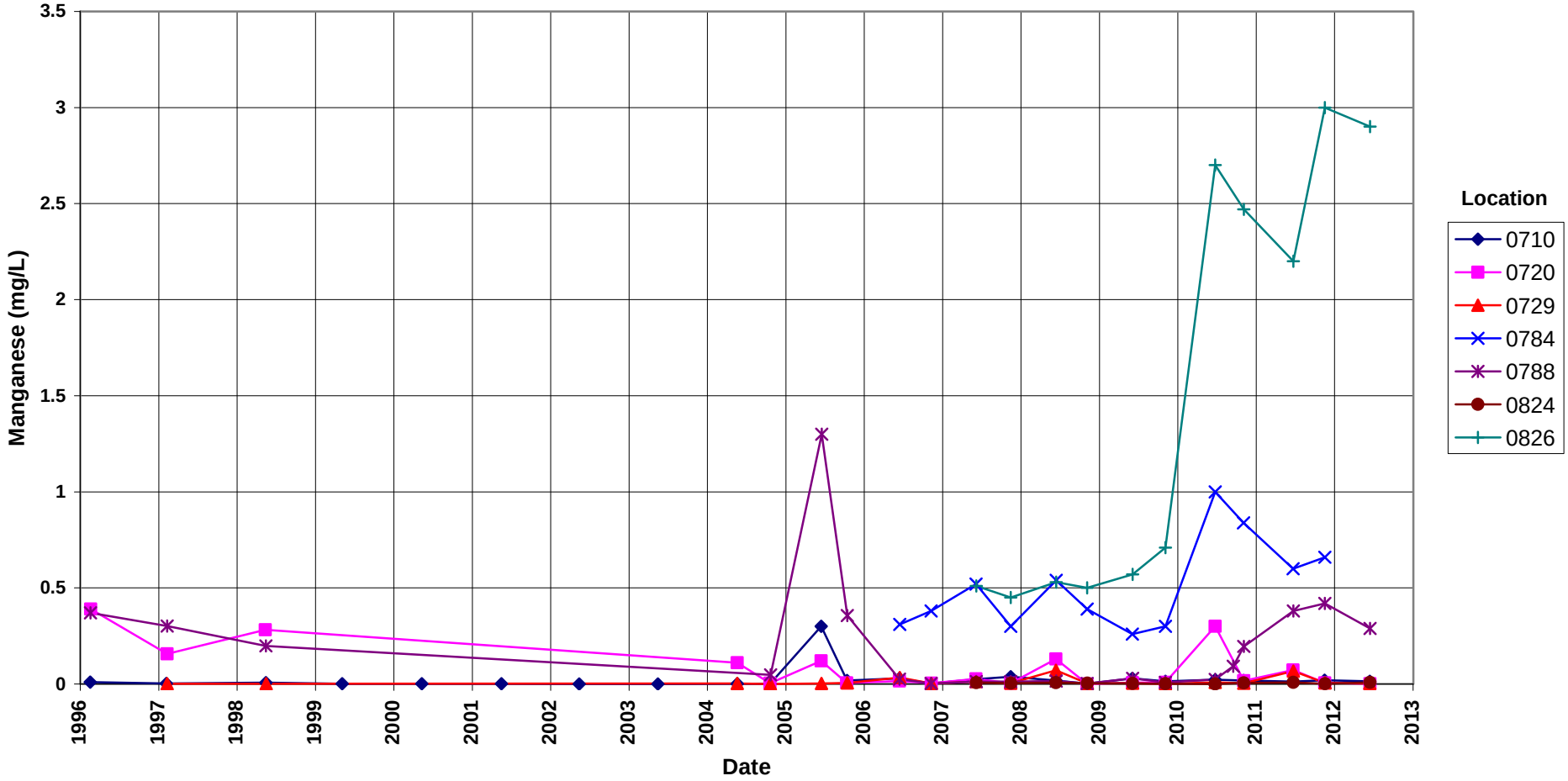
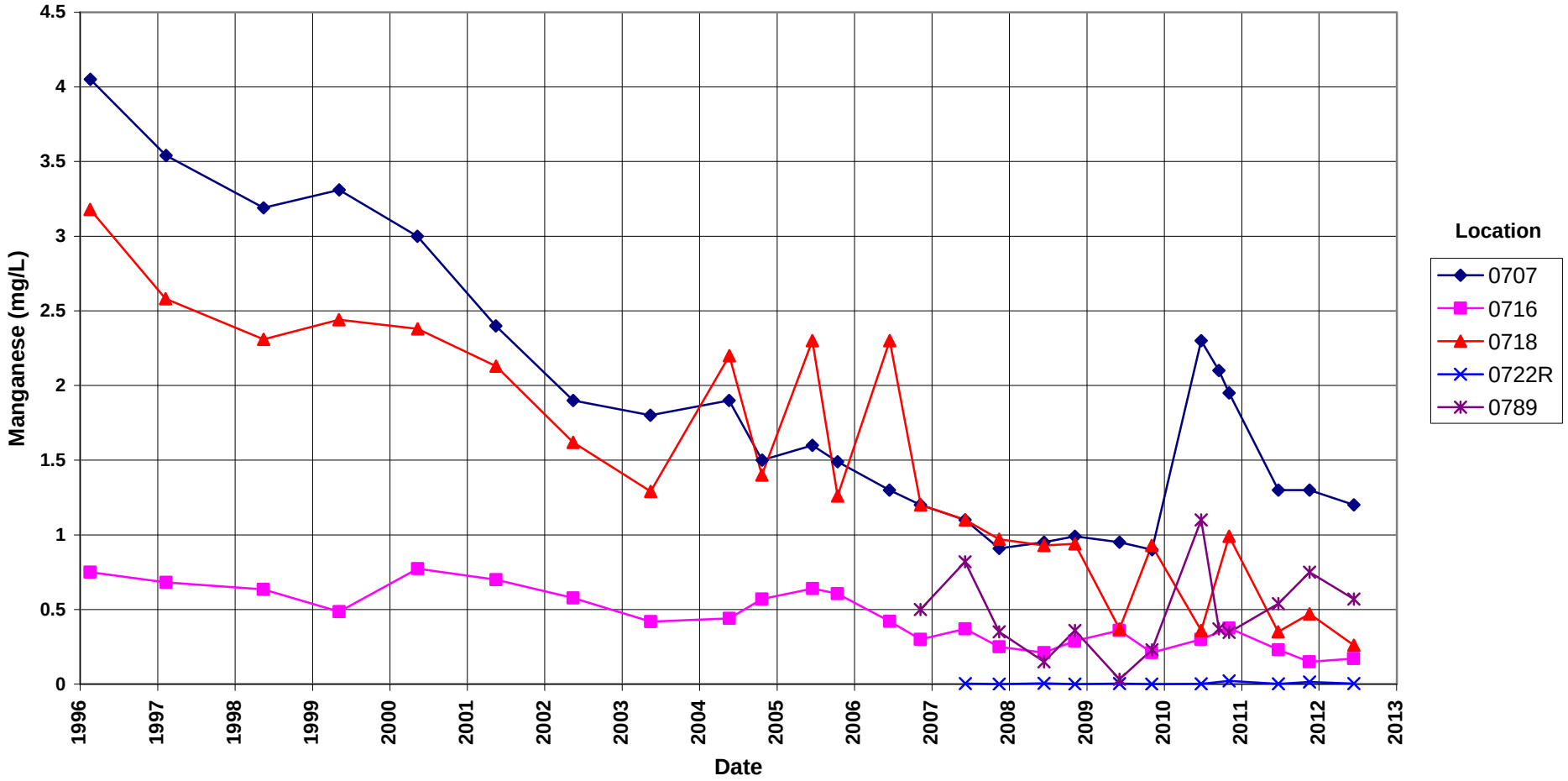
Riverton Processing Site
Manganese Concentration
Semi-Confined Aquifer Locations



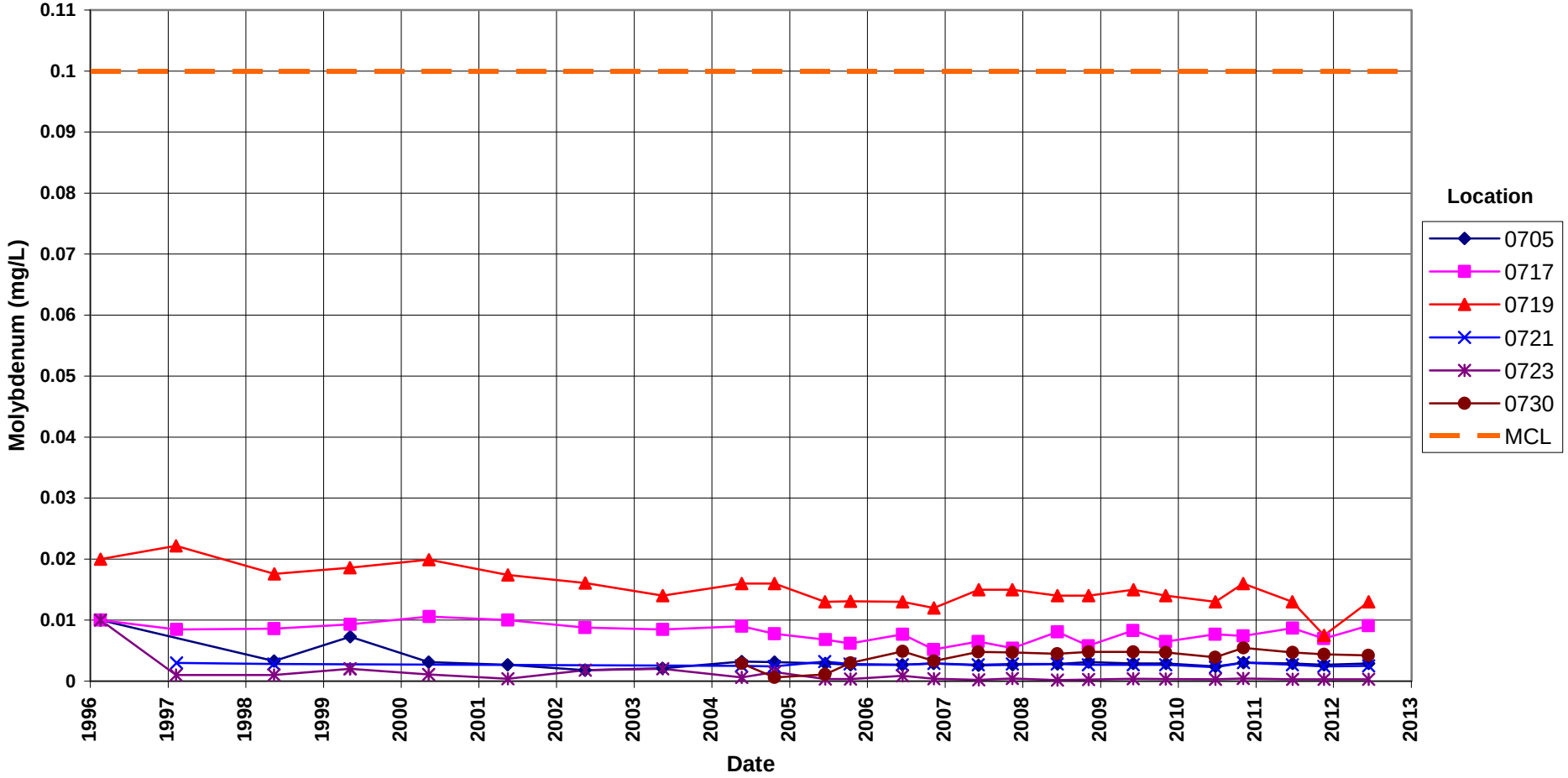
Riverton Processing Site
Manganese Concentration
Surficial Aquifer Locations



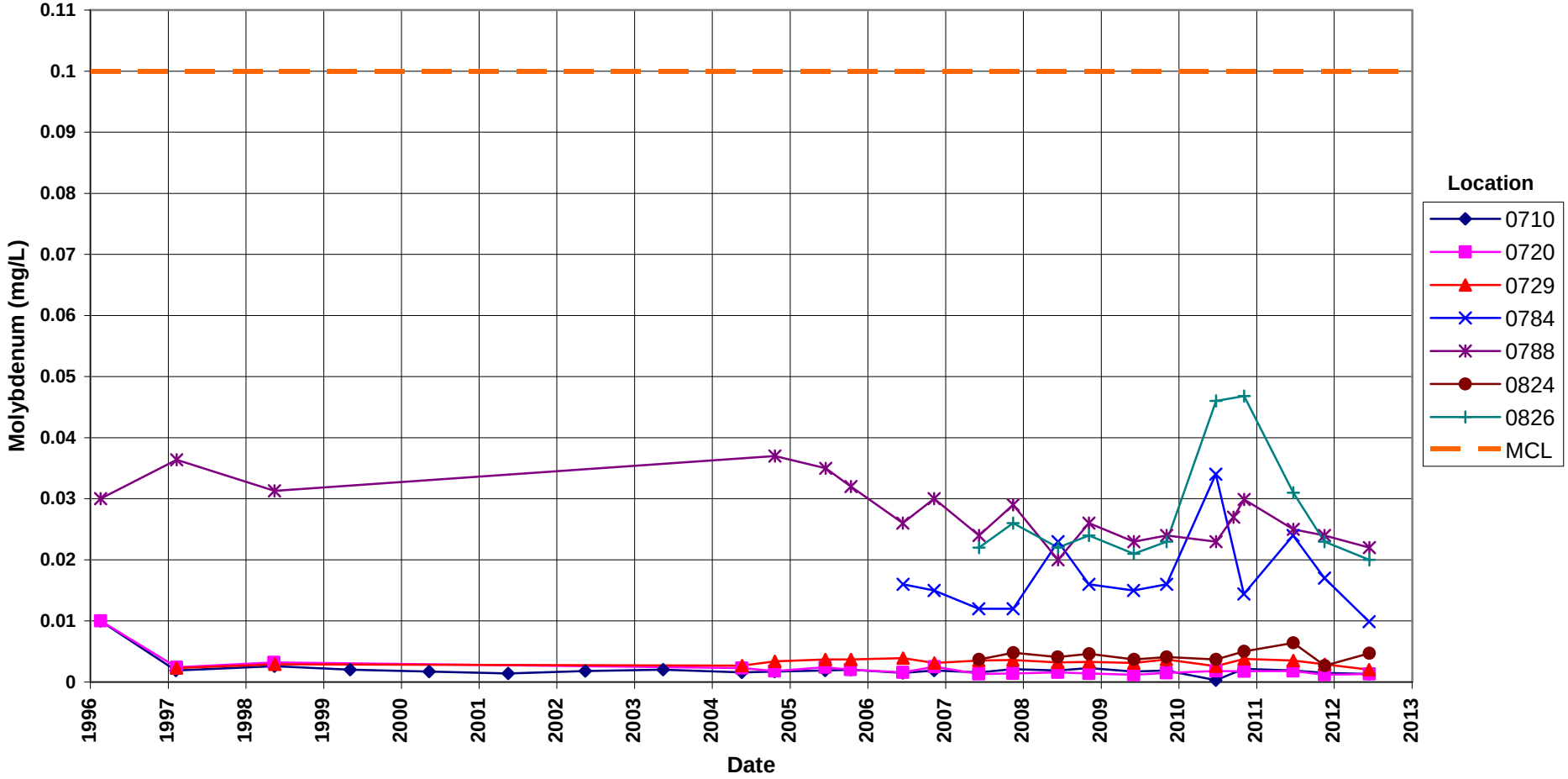
Riverton Processing Site
Manganese Concentration
Surficial Aquifer Locations



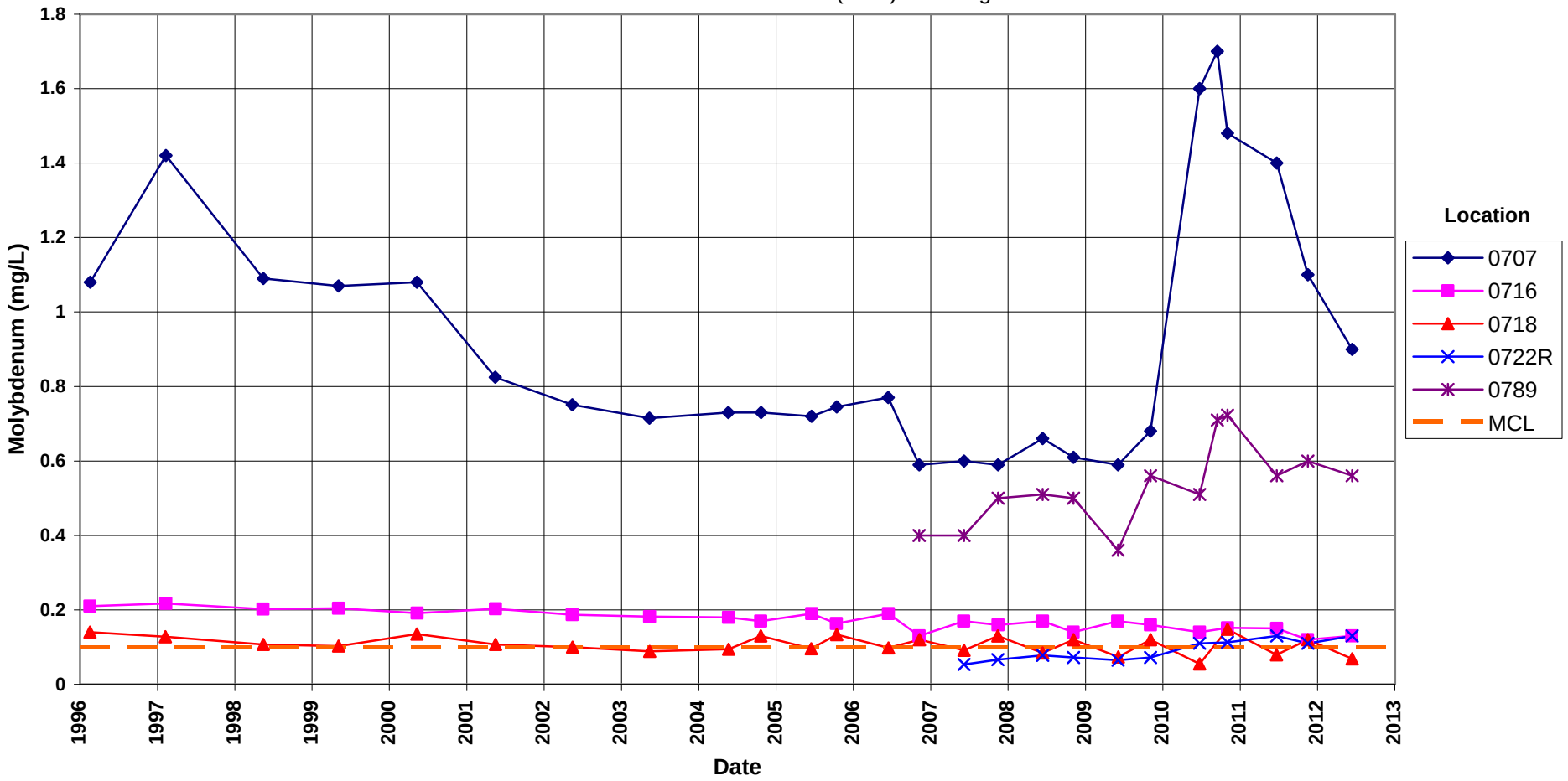
Riverton Processing Site
Molybdenum Concentration
Semi-confined Aquifer Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L



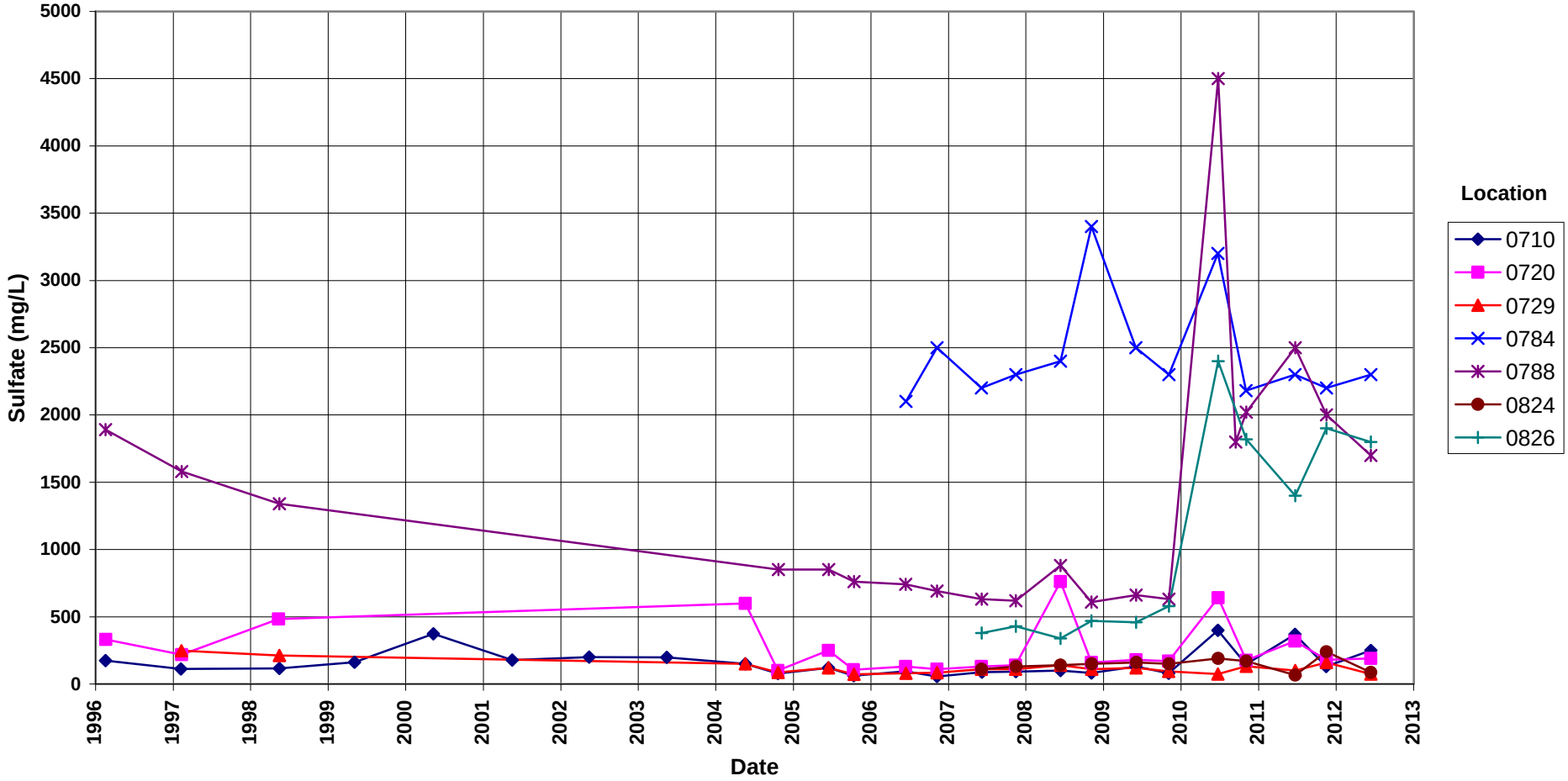
Riverton Processing Site
Molybdenum Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L



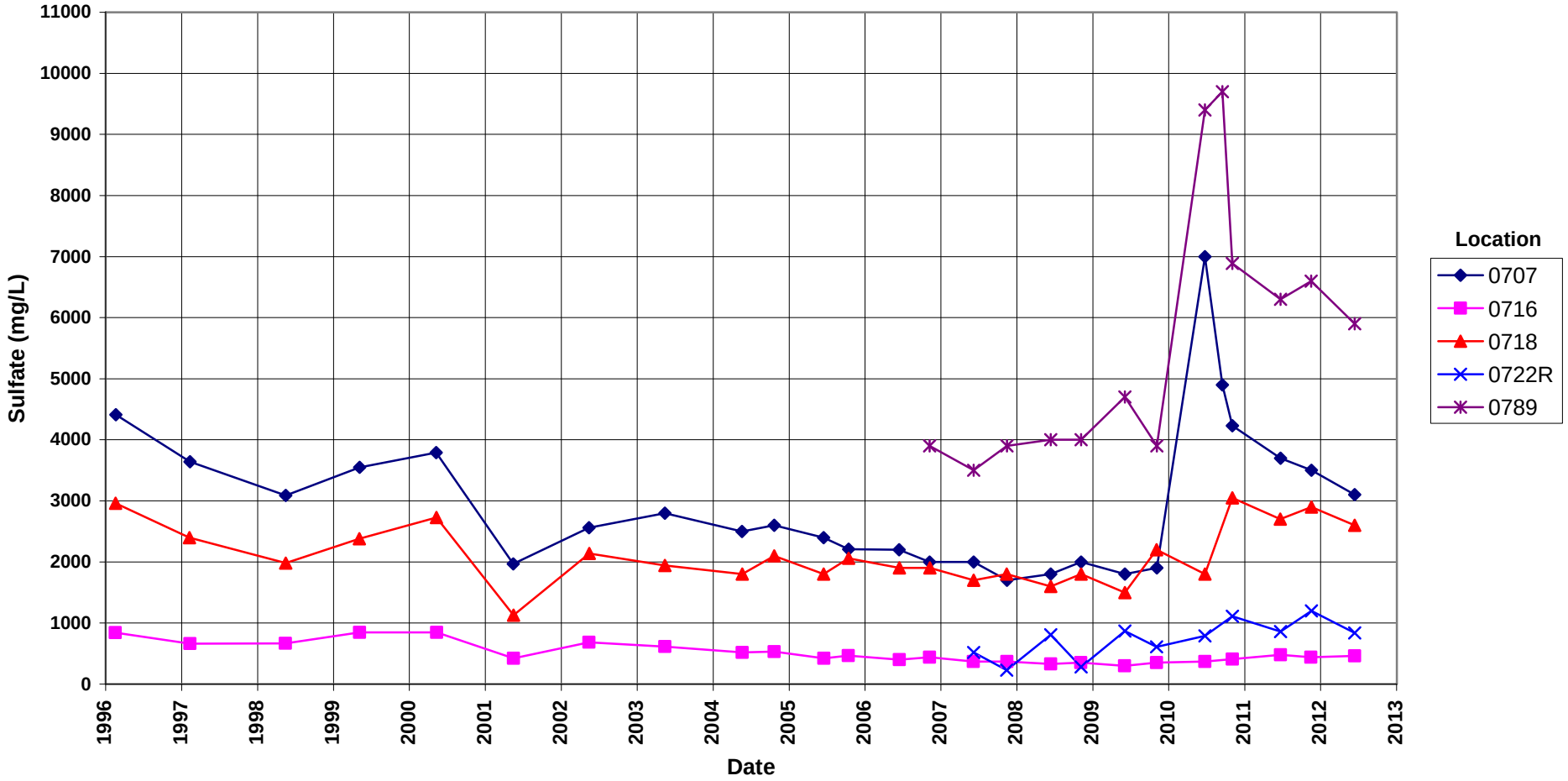
Riverton Processing Site
Molybdenum Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L



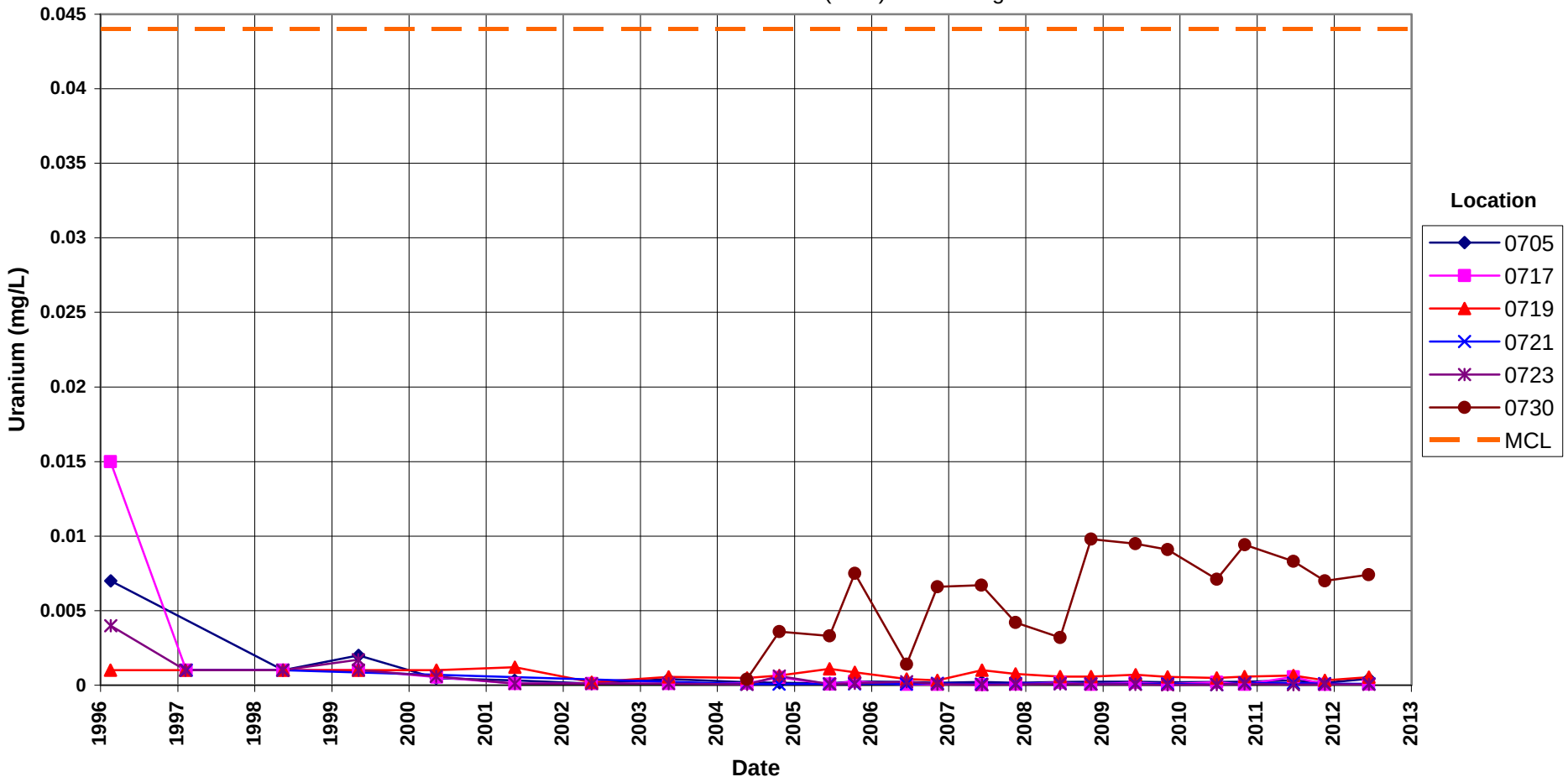
Riverton Processing Site
Sulfate Concentration
Surficial Aquifer Locations

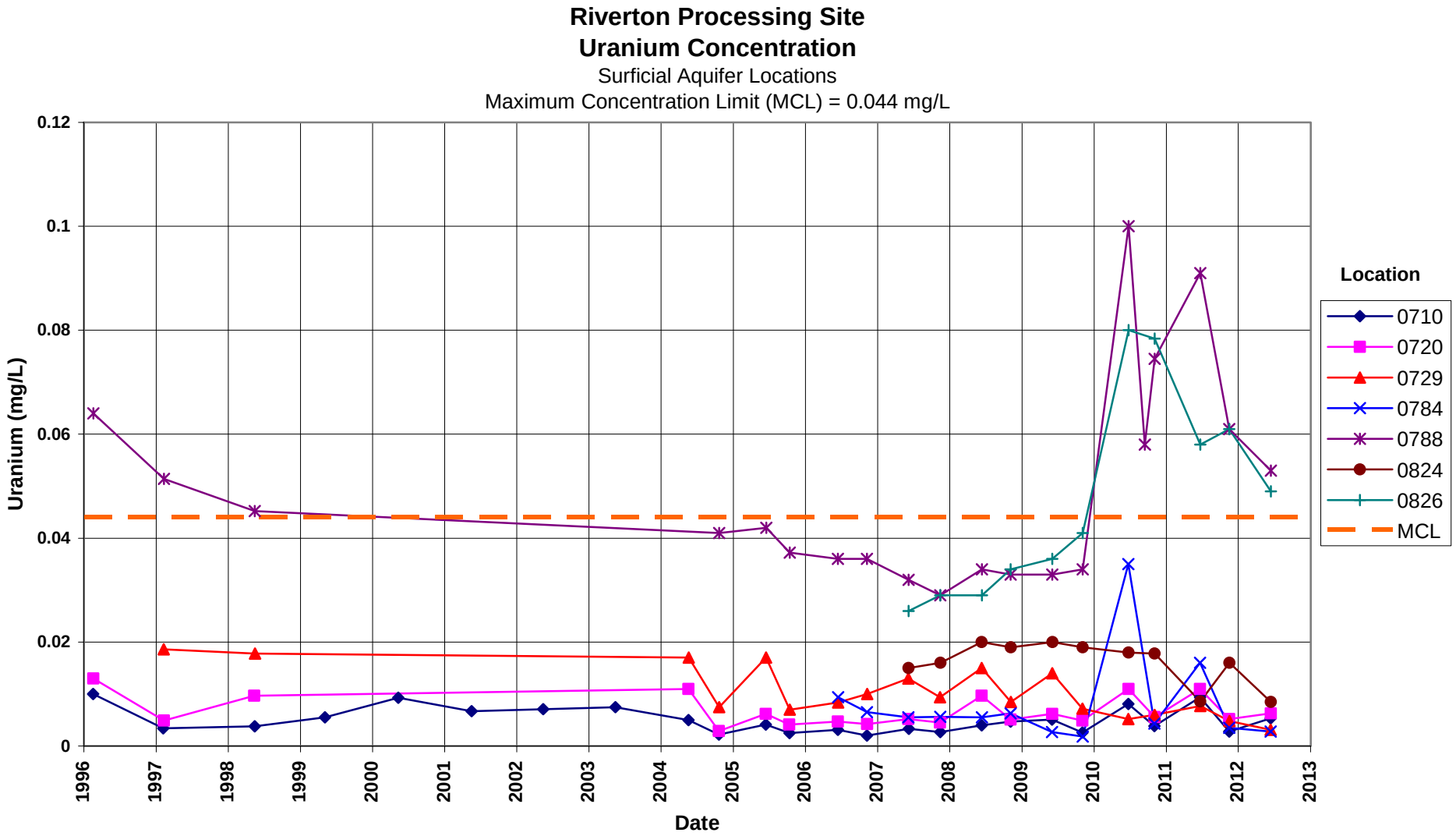


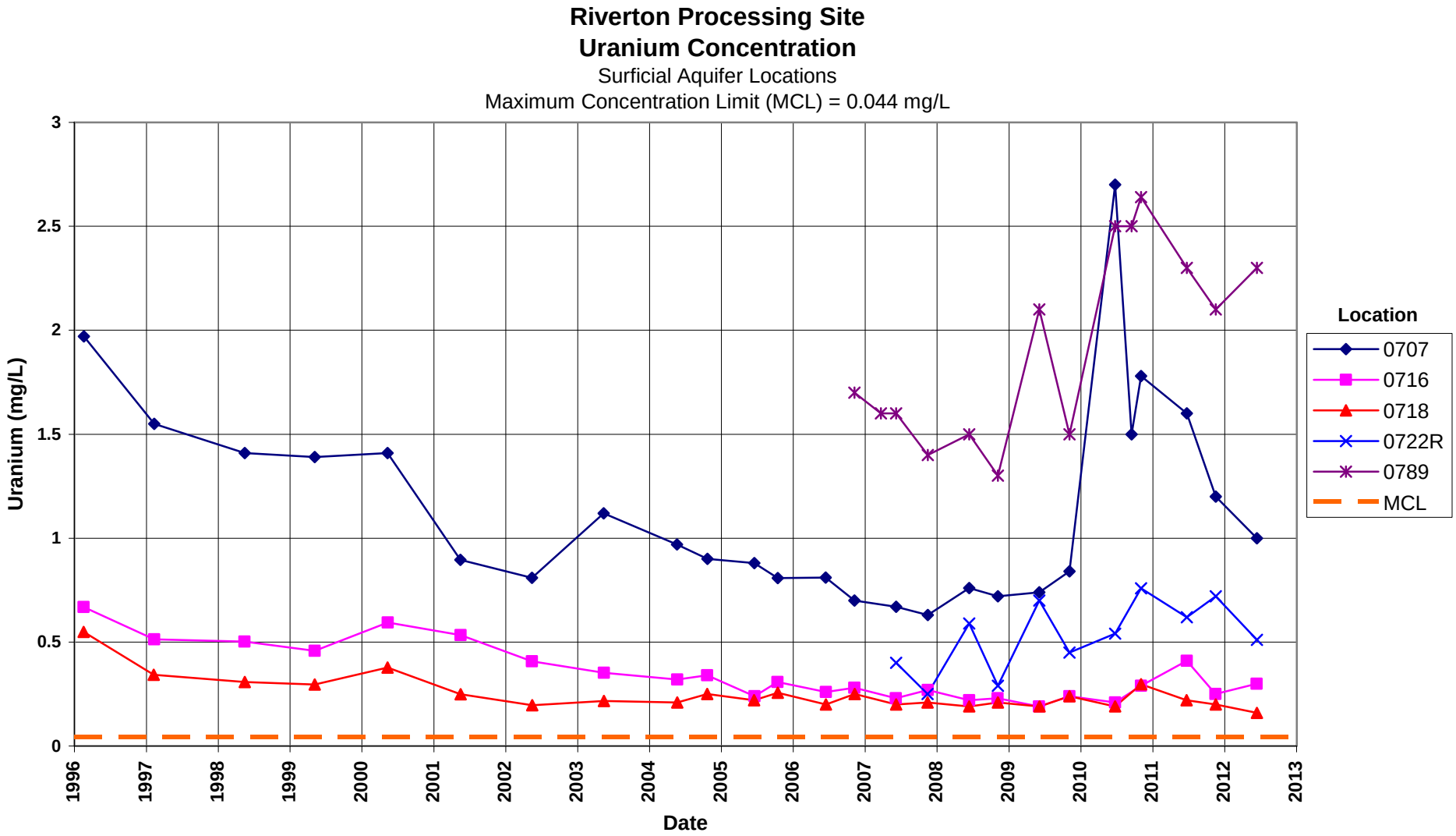
Riverton Processing Site
Sulfate Concentration
Surficial Aquifer Locations



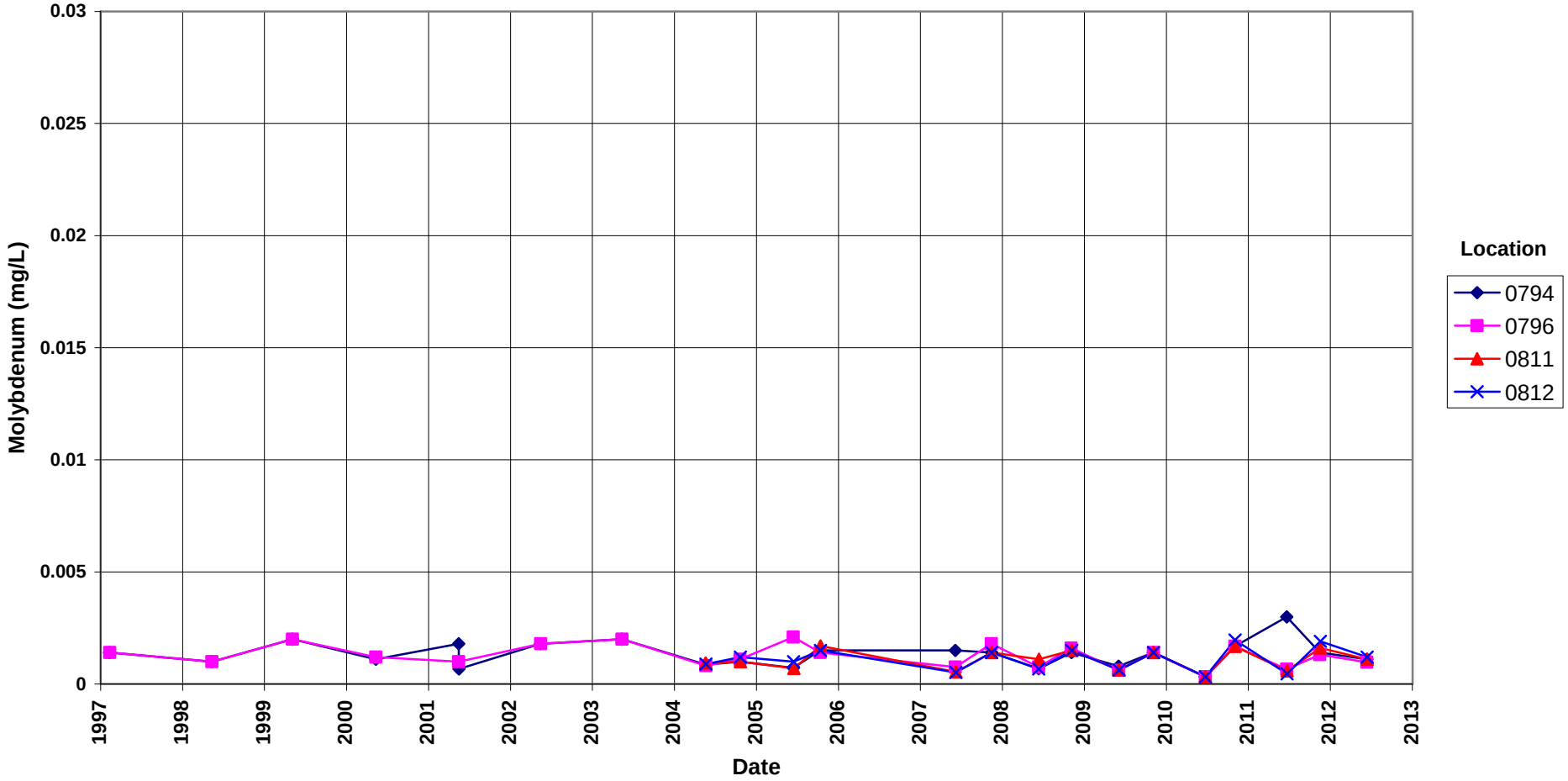
Riverton Processing Site
Uranium Concentration
Semi-Confined Aquifer Locations
Maximum Concentration Limit (MCL) = 0.044 mg/L



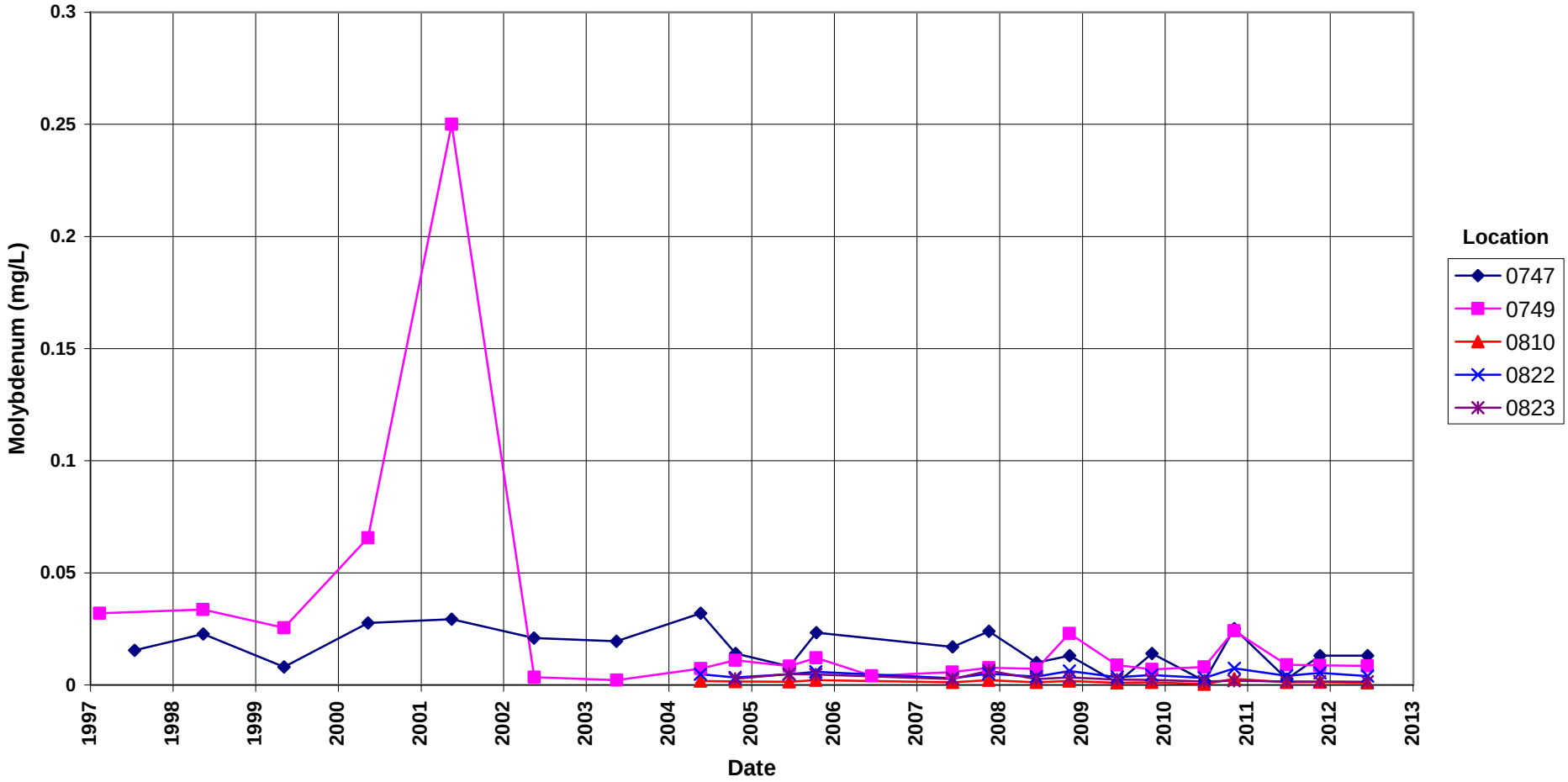

Riverton Processing Site
Uranium Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Date
Location
0710
0720
0729
0784
0788
0824
0826
MCL


Riverton Processing Site
Uranium Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
3
2.5
2
1.5
1
0.5
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Date
Location
0707
0716
0718
0722R
0789
MCL

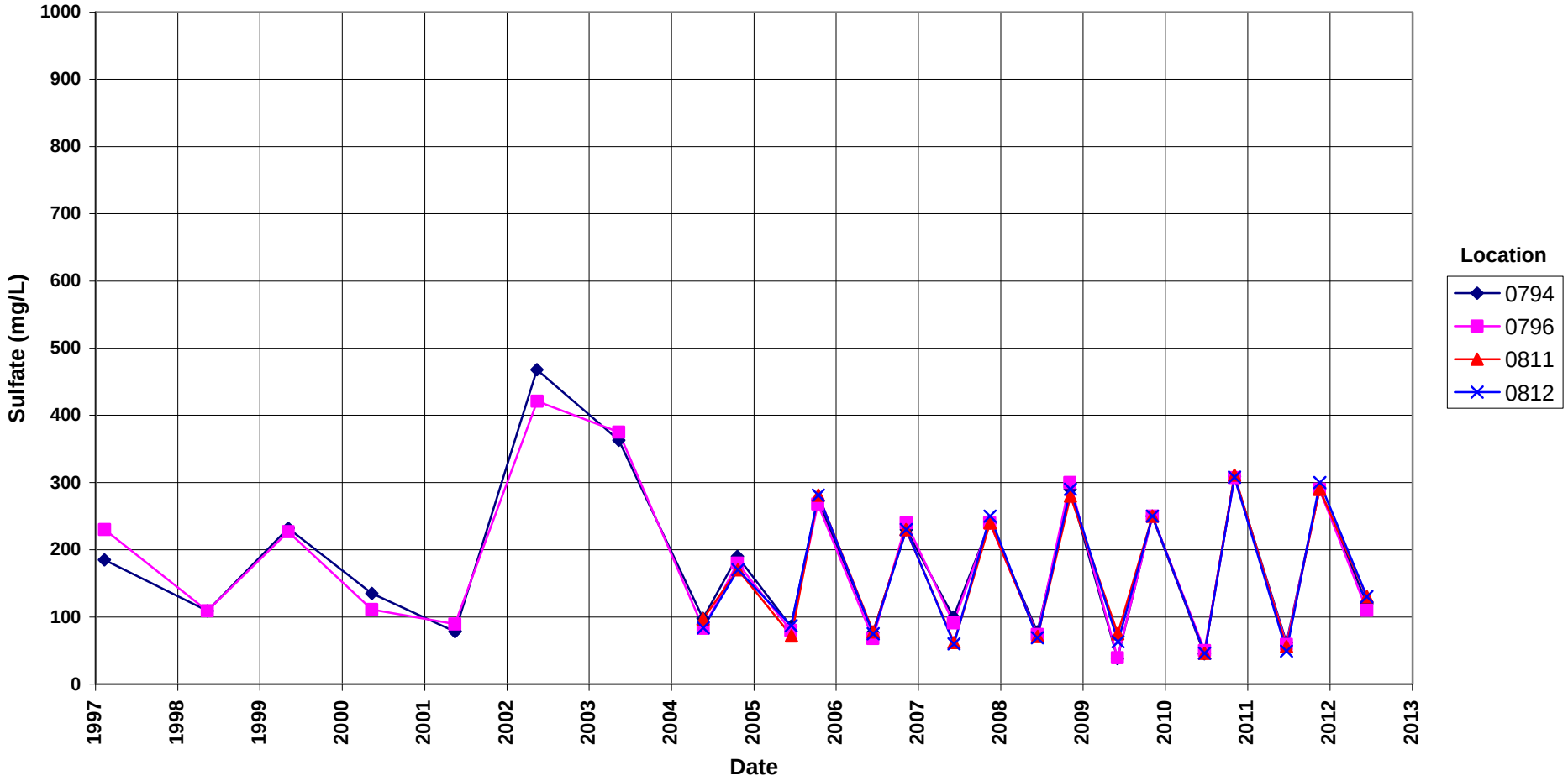
Riverton Processing Site
Molybdenum Concentration
Little Wind River Surface Water Locations

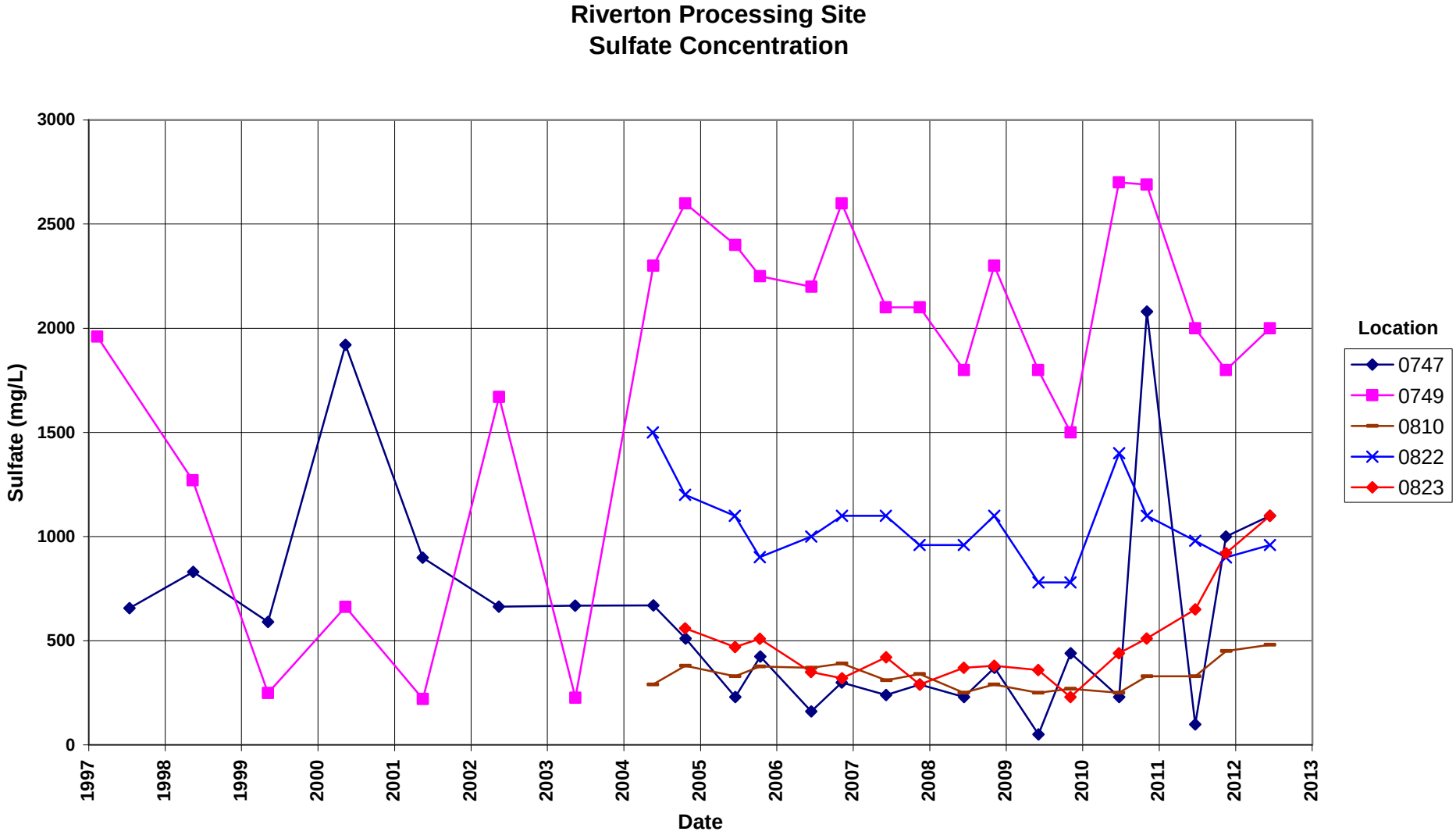


Riverton Processing Site
Molybdenum Concentration
Oxbow Lake, Wetlands, Ditch & Pond Surface Water Locations

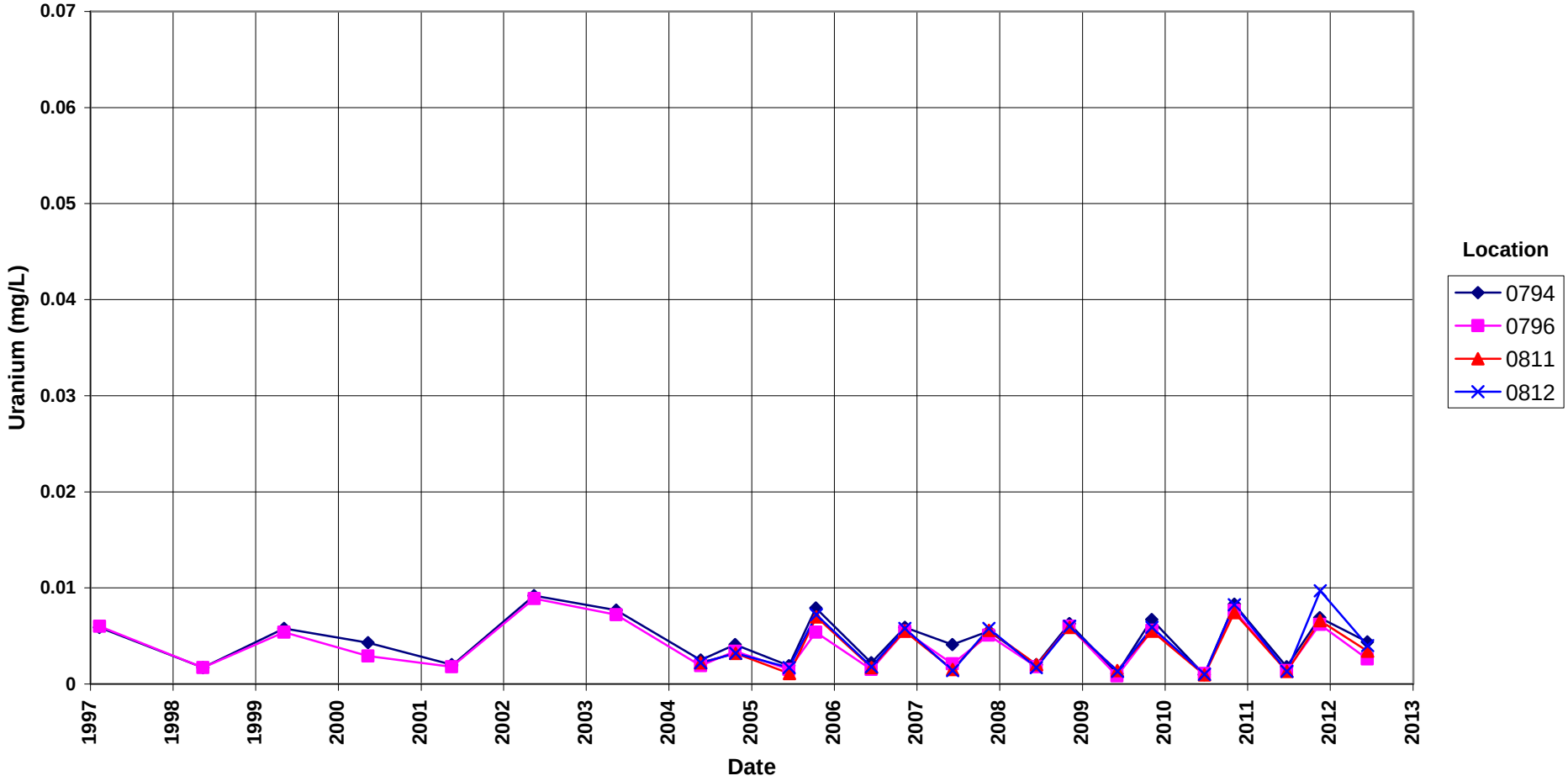


Riverton Processing Site
Sulfate Concentration
Little Wind River Surface Water Locations




Riverton Processing Site
Sulfate Concentration
Sulfate (mg/L)
3000
2500
2000
1500
1000
500
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Date
Location
0747
0749
0810
0822
0823

Riverton Processing Site
Uranium Concentration
Little Wind River Surface Water Locations



Attachment 3
Sampling and Analysis Work Order

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Stoller

established 1959

Task Order LM00-501
Control Number 12-0638

May 16, 2012

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)
June 2012 Environmental Sampling at the Riverton, Wyoming, Processing Site

REFERENCE: Task Order LM-501-02-117-402, Riverton, Wyoming, Processing Site

Dear Dr. Gil:

The purpose of this letter is to inform you of the upcoming sampling event at Riverton, Wyoming. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Riverton processing site. Water quality data will be collected from monitoring wells, domestic wells, and surface locations at this site as part of the routine environmental sampling currently scheduled to begin the week of June 11, 2012.

The following lists show the monitoring wells (with zone of completion), surface locations, and domestic wells scheduled to be sampled during this event.

Monitoring Wells*

705 Se	716 Sf	719 Se	722R Sf	730 Se	788 Sf	824 Sf
707 Sf	717 Se	720 Sf	723 Se	784 Sf	789 Sf	826 Sf
710 Sf	718 Sf	721 Se	729 Sf			

*NOTE: Se = Semi-confined sandstone; Sf = surficial

Surface Locations

747	794	810	811	812	822	823
749	796					

Domestic Wells

405	422	430	436	460	828

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) 248-6654 if you have any questions.

Sincerely,

Sam Campbell

Sam Campbell
Site Lead

SC/lcg/lb

Enclosures (3)

cc: (electronic)
Karl Stoeckle, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction
File: RVT410.02 (A)

Sampling Frequencies for Locations at Riverton, Wyoming

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
101					X	WL only
110					X	WL only
111					X	WL only
700					X	WL only
702					X	Data logger
705		X				
707		X				Data logger
709					X	WL only; Data logger
710		X				
716		X				
717		X				
718		X				
719		X				
720		X				
721		X				
722R		X				
723		X				
724					X	WL only
725					X	WL only
726					X	WL only
727					X	WL only
728					X	WL only
729		X				
730		X				
732					X	WL only
733					X	WL only
734					X	WL only
736					X	WL only
784		X				
788		X				
789		X				Data logger
824		X				
826		X				
Surface Locations						
747		X				
749		X				
794		X				
796		X				
810		X				Gravel pit
811		X				Little Wind River
812		X				Little Wind River
822		X				
823		X				
Domestic Wells						
405		X				921 Rendezvous Road
422		X				10 Whitetail Drive
430		X				204 Goes in Lodge Road
436		X				33 St Stephens Road
460		X				140 Goes in Lodge Road
828		X				33 St Stephens Road

Sampling conducted in November and June

Constituent Sampling Breakdown

Site	Riverton				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	48	18			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen	X	X			
Redox Potential	X	X			
Residual Chlorine					
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Calcium					
Chloride					
Chromium					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese	X	X	0.005	SW-846 6010	LMM-01
Molybdenum	X	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium					
Radium-226		0822 only	1 pCi/L	Gas Proportional Counter	GPC-A-018
Radium-228		0822 only	1 pCi/L	Gas Proportional Counter	GPC-A-020
Selenium					
Silica					
Sodium					
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids					
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	4	6			

Note: 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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Stoller established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: June 21, 2012

TO: Distribution

FROM: Sam Campbell

SUBJECT: Trip Report

Site: Riverton, Wyoming, Processing Site.

Dates of Sampling Event: June 11 to June 14, 2012

Team Members: Sam Campbell and Jeff Walters

Number of Locations Sampled: 18 monitoring wells, 9 surface water locations, and 11 domestic wells.

Locations Not Sampled/Reason: None.

Location Specific Information: Monitoring wells 0705, 0719, and 0730 were purged and sampled using Category II criteria; all other monitoring wells were purged and sampled using Category I criteria.

Flow in the Little Wind River was unseasonably low. The river was not flowing into the Oxbow Lake at the time of sampling.

Three domestic wells (0838, 0839, and 0840) located outside the institutional control (IC) boundary were sampled for the first time because of homeowner concerns. Domestic wells outside the IC boundary are not typically sampled, however, DOE Site Manager, April Gil, approved the sampling because of increased public concern stemming from the public meeting held in May.

Two new domestic wells (0841 and 0842) located inside the IC boundary were sampled for the first time. These homes are not connected to the alternate water supply system, and the wells are used as a potable water source; therefore, these wells will be added to the long-term monitoring network.

Coordinate data was collected at each new domestic well using a GPS unit (see attached figure).

One additional domestic well, 0422, was added back into the long-term monitoring network because the well is still used as a potable water source.

Additional analysis for selenium will be conducted on all groundwater samples collected during this sampling event based on the recommendations presented in the paper entitled *Evaluation of Groundwater Constituents and Seasonal Variation at the Riverton, Wyoming, Processing Site.*

Additional analyses will be conducted on the sample collected from upstream surface water location 0794 to provide data for the upcoming aquifer characterization study.

The area around monitoring well 0824 was flooded due to irrigation run-off from the adjacent field.

Field Variance: Only one field duplicate sample was collected during this event; however, two duplicate samples should have been collected based on the number of environmental samples collected.

Quality Control Sample Cross Reference: Following are the false identifications assigned to the quality control samples:

False ID	True ID	Sample Type	Ticket Number
2175	0789	Duplicate	KGU-556
2353	N/A	Equipment Blank	KGU-570

Requisition Numbers Assigned: All samples were assigned to requisition index number (RIN) 12054590 and were shipped to the ALS Laboratory Group on June 15, 2012.

Water Level Measurements: Water levels were measured at all sampled monitoring wells and 15 additional monitoring wells. Continuous water-level data was downloaded from transducers installed in five monitoring wells located upgradient, on, and downgradient of the site.

Well Inspection Summary: All monitoring wells were in good condition. Protective casing was installed at monitoring well 0110 (see attached photo).

Equipment: All equipment functioned properly.

Stakeholder/Regulatory: Met with the manager of the Chemtrade sulfuric acid plant, David Luzmoor, who provided access to the site.

Institutional Controls

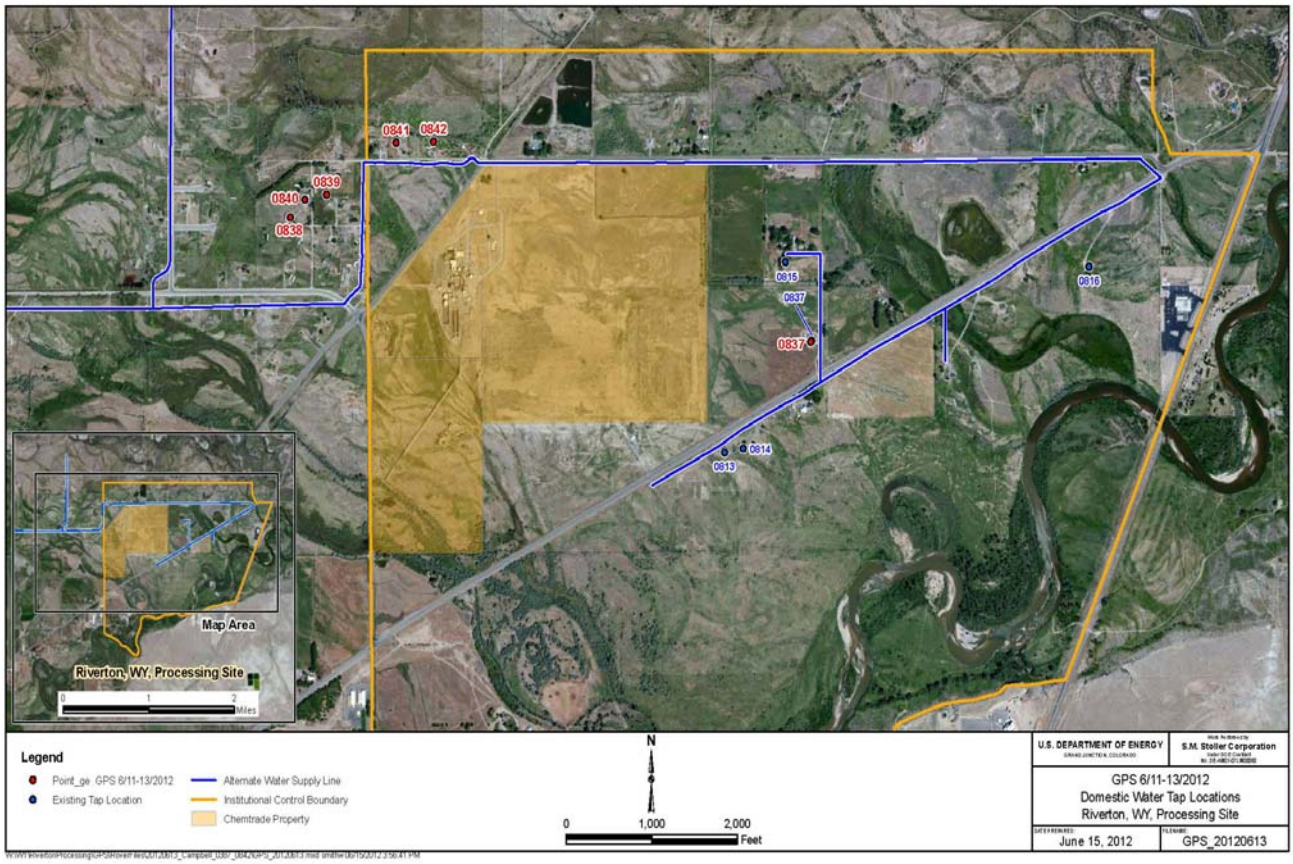
Fences, Gates, Locks: No issues identified.
Signs: The three warning signs installed around the oxbow lake were in place and in good condition.
Trespassing/Site Disturbances: None.

Access Issues: None

Corrective Action Required/Taken: Monitoring well 0110 was upgraded with new protective casing. Because of the installation of protective casing, the inner PVC casing was extended. Using a survey level and rod, the new elevation of monitoring well 0110 was 3.32 feet higher than adjacent well 0111; therefore, the new elevation of monitoring well 0110 is 4950.19. This new elevation needs to be entered into the SEEPro database.

(SEC/lg)

cc: (electronic)
April Gil, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
EDD Delivery



New Domestic Well Locations

Upgrade of Monitoring Well 0110