Data Validation Package

November 2010
Groundwater and Surface Water Sampling at the Riverton, Wyoming Processing Site

January 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Riverton, Wyoming, Processing Site

Sampling Period: November 2–4, 2010

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 involved sampling 18 monitoring wells, 9 surface water locations, and 4 domestic wells at the Riverton, Wyoming, Processing Site.

Water levels were measured at all sampled monitoring wells and 14 additional monitoring wells that were not sampled. Sampling and analysis 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. Contaminant concentrations exceeded historical maximum values at many groundwater locations.

Results from domestic wells (locations 0405, 0430, 0436, and 0460) did not indicate any impacts from the Riverton site. Concentrations of molybdenum and uranium in samples collected from domestic wells were below EPA groundwater and drinking water standards, respectively.

Table 1. Riverton Wells with Samples that Exceeded EPA Groundwater Standards in November 2010

Analyte	Standard[a]	Location	Concentration in milligrams per liter (mg/L)
Molybdenum	0.1	0707	1.48
		0716	0.15
		0718	0.15
		0722R	0.11
		0789	0.72
Uranium	0.044	0707	1.78
		0716	0.29
		0718	0.30
		0722R	0.76
		0788	0.07
		0789	2.64
		0826	0.08

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A.

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 2, 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 2. Comparison of Surface Water Concentrations (November 2010) to Benchmark

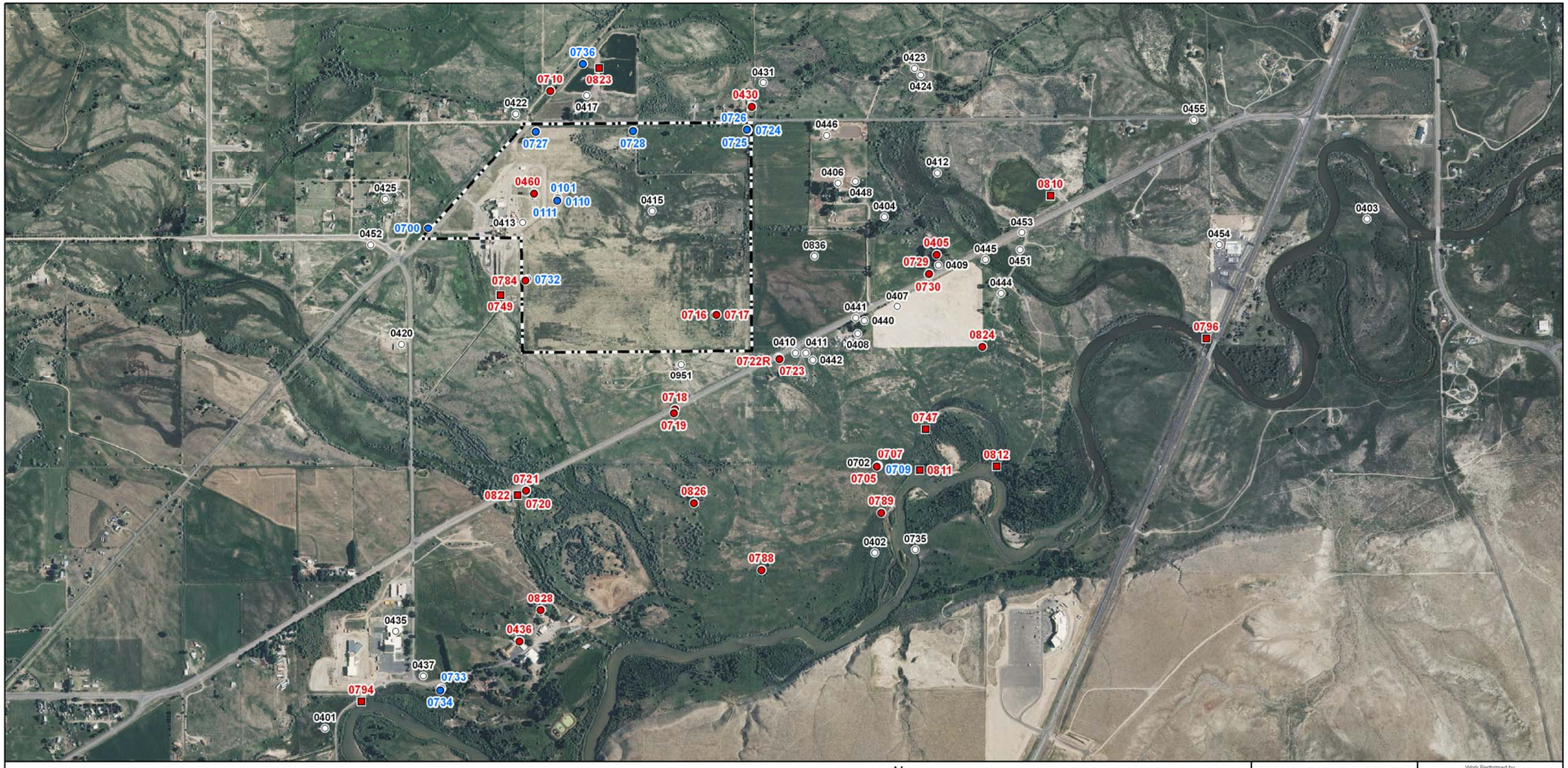
Location	Uranium Concentration (mg/L)
0794 Benchmark	**0.011**
0796 Little Wind River	0.0077
0811 Little Wind River	0.0075
0812 Little Wind River	0.0083
0747 Oxbow Lake	0.543
0810 Constructed Wetlands	0.0093
0822 West Side Irrigation Ditch	0.010
0823 Gravel Pit Pond	0.0039

The sample collected at the ditch that discharges from the Chemtrade sulfuric acid plant (0749) continues to have elevated concentrations of sulfate (2,690 mg/L). The elevated sulfate concentration in the sulfuric acid plant effluent has affected the sulfate concentration downstream in the west side irrigation ditch (1,080 mg/L at location 0822).

Water samples from 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 slightly above, and the radium-228 concentration below, the respective Decision Level Concentration indicating no impact to water quality in the ditch.

Sam Campbell
Site Lead, S.M. Stoller Corporation

1-6-2011
Date



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**	November 2–4, 2010
Date(s) of Verification	December 20, 2010	**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 October 7, 2010.
2. Were the sampling locations specified in the planning documents sampled?	No	Domestic well 0828 was not sampled because the tap had been shut off and winterized.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on October 29, 2010.
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?	Yes	A duplicate sample was collected from locations 0705 and 0822.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	No	An equipment blank was not collected.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location IDs 2644 and 2645 were used for the QC samples.
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):	10103411
Sample Event:	November 2–4, 2010
Site(s):	Riverton, Wyoming
Laboratory:	GEL Laboratories, Charleston, South Carolina
Work Order No.:	266512
Analysis:	Metals, Wet Chemistry, and Radiochemistry
Validator:	Steve Donivan
Review Date:	December 17, 2010

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
Manganese	LMM-01	SW-846 3005A	SW-846 6010B
Molybdenum, Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Radium-226	GPC-A-018	PA SOP712R14	PA SOP724R10
Radium-228	GPC-A-020	PA SOP746R8	PA SOP724R10
Sulfate	MIS-A-044	MCAWW 300.0	MCAWW 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
266512011	0723	Molybdenum	U	Less than 5 times the method blank
266512011	0723	Sulfate	J	Matrix spike failure
266512011	0723	Uranium	U	Less than 5 times the calibration blank
266512030	0436	Uranium	U	Less than 5 times the calibration blank
266512033	0822 Duplicate	Radium-226	J	Less than 3 times the determination limit
266512033	0822 Duplicate	Radium-228	J	Less than 3 times the determination limit

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received 33 water samples on November 6, 2010, accompanied by a Chain of Custody form. The Chain of Custody form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents had no errors or omissions.

Preservation and Holding Times

The sample shipment was received cool and intact with the temperature inside the iced cooler at 2.0 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses with the following exception. The metals bottle for sample 0436 was received at a pH of 6. The sample aliquot was acidified to a pH less than 2 by the laboratory upon receipt.

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 SW-846 6010, Manganese
Calibrations for manganese were performed on November 24, 29, and 30, 2010, 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 method detection limit (MDL). Initial and continuing calibration verification checks were made at the required frequency resulting in 62 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 practical quantitation limit (PQL) and all results were within the acceptance range.

Method SW-846 6020, Molybdenum and Uranium
Calibrations for molybdenum and uranium were performed on November 29-30 and December 1, 2010, using two calibration standards. Initial and continuing calibration verification checks were made at the required frequency resulting in eight 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, Sulfate
The calibration for sulfate was performed using seven calibration standards on November 1, 2010. 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.

Radiochemical Analysis

Radiochemical results are qualified with a "U" flag (not detected) when the result is greater than the minimum detectable concentration (MDC) but less than the Decision Level Concentration, estimated as 3 times the one-sigma total propagated uncertainty. Results above the Decision Level Concentration and the MDC are qualified with a "J" flag (estimated) when the result is less than Determination Limit (3 times the MDC).

Radium-226
Instrument calibration was performed September 1, 2010. 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 August 1, 2010. 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 PQL for all analytes. In cases where a blank concentration exceeds the MDL, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the MDL but less than 5 times the blank concentration.

Radiochemistry
The radium-226 and radium-228 method blank results were below the decision level concentration.

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

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental 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 with the following exception. The sulfate MS recovery from sample 0723 did not meet the acceptance criteria. The sulfate result for that sample is qualified with a "J" flag as an estimated value.

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 are 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 100 times the PQL for ICP-MS or greater than 50 times the PQL for ICP. All serial dilution data evaluated met the acceptance criteria.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of molybdenum and uranium to reduce interferences. The required detection limits were met for all metals and wet chemistry analytes.

All radiochemical MDCs were calculated using the following equation as specified in *Quality Systems for Analytical Services* revision 2.5. All reported MDCs were less than the required MDCs.

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 arrived on December 6, 2010. 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 contents of the EDDs 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: 10103411 **Lab Code:** GEN **Validator:** Steve Donivan **Validation Date:** 12/16/2010

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

# of Samples: 33 **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	
☑ Field Duplicates	There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 10103411 **Lab Code:** GEN **Date Due:** 12/4/2010

Matrix: Water **Site Code:** RVT **Date Completed:** 12/6/2010

Analyte	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								
Manganese	11/24/2010	0.0000	1.0000	OK	OK	OK	OK	OK	99.7	96.5			96.0	5.0	109.0
Manganese	11/29/2010	0.0000	1.0000	OK	OK	OK	OK	OK	100.0	97.0		1.0	96.0	3.0	105.0
Manganese	11/30/2010	0.0000	1.0000	OK	OK	OK	OK	OK	102.0	96.7		11.0	96.0		105.0
Molybdenum	11/30/2010			OK	OK	OK	OK	OK	96.0	96.4		3.0	99.0	5.0	103.0
Molybdenum	11/30/2010			OK	OK	OK	OK	OK	101.0	108.0		2.0	94.0	8.0	106.0
Molybdenum	11/30/2010								99.8	103.0		6.0	98.0	3.0	104.0
Uranium	11/30/2010			OK	OK	OK	OK	OK	103.0	102.0			109.0	1.0	117.0
Uranium	12/01/2010			OK	OK	OK	OK	OK	103.0	105.0		3.0	114.0		114.0
Uranium	12/01/2010								105.0	99.6			113.0		119.0

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 10103411 **Lab Code:** GEN **Date Due:** 12/4/2010

Matrix: Water **Site Code:** RVT **Date Completed:** 12/6/2010

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
0822	Radium-226	11/23/2010						1.93
Blank_Spike	Radium-226	11/23/2010				92.90		
0822	Radium-226	11/23/2010					78.0	
Blank	Radium-226	11/23/2010	0.2950	U				
0822	Radium-228	11/19/2010			87.0			
2645	Radium-228	11/19/2010			85.0			
2940	Radium-228	11/19/2010			96.0			
Blank_Spike	Radium-228	11/19/2010			87.0	106.00		
2940	Radium-228	11/19/2010			91.0		75.1	0.80
Blank	Radium-228	11/19/2010	0.4230	U	76.0			

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 10103411 **Lab Code:** GEN **Date Due:** 12/4/2010

Matrix: Water **Site Code:** RVT **Date Completed:** 12/6/2010

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
Sulfate	11/09/2010	0.000	1.0000	OK	OK	OK	OK	OK	95.80	96.5		1.00	
Sulfate	11/10/2010				OK		OK	OK	95.80	111.0		1.00	
Sulfate	11/10/2010								96.30	96.6		1.00	
Sulfate	11/11/2010				OK		OK	OK		102.0		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, 0430, 0436, and 0460) 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 therefore, results from these wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

An equipment blank was not collected.

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. Duplicate samples were collected from locations 0705 and 0822 (field duplicate IDs 2644 and 2645, respectively). The duplicate results were acceptable, meeting the EPA recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the PQL.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 10103411 **Lab Code:** GEN **Project:** Riverton **Validation Date:** 12/16/2010

Duplicate: 2644 **Sample:** 0705

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	33.2			1.00	30.3			1.00	9.13		ug/L
Molybdenum	3.02			1.00	2.87	B		1.00	5.09		ug/L
Sulfate	411			100.00	414			100.00	0.73		mg/L
Uranium	0.241			1.00	0.165			1.00			ug/L

Duplicate: 2645 **Sample:** 0822

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	35.1			1.00	35			1.00	0.29		ug/L
Molybdenum	7.46			1.00	7.32			1.00	1.89		ug/L
Radium-226	0.889		0.369	1.00	0.498		0.282	1.00		1.7	pCi/L
Radium-228	0.425	U	0.350	1.00	0.762		0.416	1.00		1.2	pCi/L
Sulfate	1080			100.00	1100			100.00	1.83		mg/L
Uranium	10.3			1.00	10.5			1.00	1.92		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: 1-5-2011

Data Validation Lead: Steve Donivan — Date: 1-5-2011

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.

Two field measurement results and two laboratory results were identified as potentially anomalous. There were no errors noted during the review of these data, and the data for this RIN are acceptable as qualified.

Data Validation Outliers Report - Field Parameters Only

Comparison: All Historical Data

Laboratory: Field Measurements

RIN: 10103411

Report Date: 12/20/2010

					Current			Historical Maximum			Historical Minimum			Number of		Statistical
						Qualifiers			Qualifiers			Qualifiers		Data Points		Outlier
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
RVT01	0405	N001	11/03/2010	Specific Conductance	1094			1031		G	633			22	0	No
RVT01	0436	N001	11/03/2010	Alkalinity, Total (As CaCO3)	155			174			156			13	0	No
RVT01	0460	N001	11/03/2010	Alkalinity, Total (As CaCO3)	157			194			158			9	0	No
RVT01	0705	N001	11/03/2010	Specific Conductance	1349		FQ	1338		FQ	700		GF	33	0	No
RVT01	0710	N001	11/02/2010	Temperature	13.09		F	13.02		F	5.8			28	0	No
RVT01	0717	N001	11/02/2010	Specific Conductance	2155		F	2090			324			23	0	No
RVT01	0718	N001	11/02/2010	Specific Conductance	6505		F	5050			2490			22	0	Yes
RVT01	0719	N001	11/02/2010	Alkalinity, Total (As CaCO3)	127		FQ	122		FQ	75		L	22	0	No
RVT01	0721	N001	11/03/2010	Specific Conductance	990		F	949		F	602			18	0	No
RVT01	0722R	N001	11/02/2010	Specific Conductance	2627		F	2031		F	992		F	7	0	No
RVT01	0729	N001	11/03/2010	Alkalinity, Total (As CaCO3)	263		F	390		F	274		F	13	0	No
RVT01	0784	N001	11/02/2010	Alkalinity, Total (As CaCO3)	139		F	453		F	242		F	5	0	No
RVT01	0784	N001	11/02/2010	pH	7.55		F	8.09		F	7.61		F	9	0	No
RVT01	0784	N001	11/02/2010	Temperature	15.07		F	14.1		F	11.31		F	9	0	No
RVT01	0788	N001	11/03/2010	Alkalinity, Total (As CaCO3)	449		F	432			370		F	10	0	Yes
RVT01	0789	N001	11/03/2010	Alkalinity, Total (As CaCO3)	543		F	448		F	313		F	5	0	No
RVT01	0789	N001	11/03/2010	Turbidity	1.05		F	9.54			1.19		F	10	0	No
RVT01	0824	N001	11/03/2010	Specific Conductance	1013		F	981		F	758		F	7	0	No
RVT01	0824	N001	11/03/2010	Temperature	12.89		F	11.79		F	8.45		F	7	0	No

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: GEL Laboratories
RIN: 10103411
Report Date: 12/20/2010

					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	0460	N001	11/03/2010	Sulfate	181			170			150			15	0	No
RVT01	0718	N001	11/02/2010	Sulfate	3050		F	2960	I		1130	N	J	24	0	No
RVT01	0722R	N001	11/02/2010	Manganese	0.0208		F	0.0051		F	0.00013	B	JF	7	2	Yes
RVT01	0722R	N001	11/02/2010	Molybdenum	0.113		F	0.11		F	0.053		F	7	0	No
RVT01	0722R	N001	11/02/2010	Sulfate	1110		F	870		F	230		F	7	0	No
RVT01	0722R	N001	11/02/2010	Uranium	0.759		F	0.7		F	0.25		F	7	0	No
RVT01	0789	N001	11/03/2010	Molybdenum	0.723		F	0.71		F	0.34		F	14	0	Yes
RVT01	0789	N001	11/03/2010	Uranium	2.64		F	2.5		F	1.3		F	15	0	No
RVT01	0824	N001	11/03/2010	Molybdenum	0.00503		F	0.0048		F	0.0037		F	7	0	No
RVT01	0826	N001	11/03/2010	Molybdenum	0.0468		F	0.046		F	0.021		F	8	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: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	-	48			#		
Dissolved Oxygen	mg/L	11/03/2010	N001	-	8.35			#		
Manganese	mg/L	11/03/2010	N001	-	0.00344	B		#	0.002	
Molybdenum	mg/L	11/03/2010	N001	-	0.00441			#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	-	-24.6			#		
pH	s.u.	11/03/2010	N001	-	9.11			#		
Specific Conductance	umhos /cm	11/03/2010	N001	-	1094			#		
Sulfate	mg/L	11/03/2010	N001	-	348			#	10	
Temperature	C	11/03/2010	N001	-	11.29			#		
Turbidity	NTU	11/03/2010	N001	-	3.19			#		
Uranium	mg/L	11/03/2010	N001	-	0.00005	U		#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	-	161			#		
Dissolved Oxygen	mg/L	11/02/2010	N001	-	2.6			#		
Manganese	mg/L	11/02/2010	N001	-	0.00321	B		#	0.002	
Molybdenum	mg/L	11/02/2010	N001	-	0.00233	B		#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	-	21.1			#		
pH	s.u.	11/02/2010	N001	-	8.72			#		
Specific Conductance	umhos /cm	11/02/2010	N001	-	847			#		
Sulfate	mg/L	11/02/2010	N001	-	195			#	10	
Temperature	C	11/02/2010	N001	-	13.33			#		
Turbidity	NTU	11/02/2010	N001	-	2.68			#		
Uranium	mg/L	11/02/2010	N001	-	0.00005	U		#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	-	155			#		
Dissolved Oxygen	mg/L	11/03/2010	N001	-	3.37			#		
Manganese	mg/L	11/03/2010	N001	-	0.002	U		#	0.002	
Molybdenum	mg/L	11/03/2010	N001	-	0.00317			#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	-	63.9			#		
pH	s.u.	11/03/2010	N001	-	8.84			#		
Specific Conductance	umhos /cm	11/03/2010	N001	-	868			#		
Sulfate	mg/L	11/03/2010	N001	-	202			#	10	
Temperature	C	11/03/2010	N001	-	16.41			#		
Turbidity	NTU	11/03/2010	N001	-	1.53			#		
Uranium	mg/L	11/03/2010	N001	-	0.000089	B	U	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	-	157			#		
Dissolved Oxygen	mg/L	11/03/2010	N001	-	1.45			#		
Manganese	mg/L	11/03/2010	N001	-	0.002	U		#	0.002	
Molybdenum	mg/L	11/03/2010	N001	-	0.00285	B		#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	-	99.4			#		
pH	s.u.	11/03/2010	N001	-	8.9			#		
Specific Conductance	umhos /cm	11/03/2010	N001	-	807			#		
Sulfate	mg/L	11/03/2010	N001	-	181			#	10	
Temperature	C	11/03/2010	N001	-	22.89			#		
Turbidity	NTU	11/03/2010	N001	-	2.71			#		
Uranium	mg/L	11/03/2010	N001	-	0.00005	U		#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	37.3	-	61.8	51		FQ	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	37.3	-	61.8	4.61		FQ	#		
Manganese	mg/L	11/03/2010	N001	37.3	-	61.8	0.0332		FQ	#	0.002	
Manganese	mg/L	11/03/2010	N002	37.3	-	61.8	0.0303		FQ	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	37.3	-	61.8	0.00302		FQ	#	0.000167	
Molybdenum	mg/L	11/03/2010	N002	37.3	-	61.8	0.00287	B	FQ	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	37.3	-	61.8	27.8		FQ	#		
pH	s.u.	11/03/2010	N001	37.3	-	61.8	8.37		FQ	#		
Specific Conductance	umhos /cm	11/03/2010	N001	37.3	-	61.8	1349		FQ	#		
Sulfate	mg/L	11/03/2010	N001	37.3	-	61.8	411		FQ	#	10	
Sulfate	mg/L	11/03/2010	N002	37.3	-	61.8	414		FQ	#	10	
Temperature	C	11/03/2010	N001	37.3	-	61.8	7.96		FQ	#		
Turbidity	NTU	11/03/2010	N001	37.3	-	61.8	4.18		FQ	#		
Uranium	mg/L	11/03/2010	N001	37.3	-	61.8	0.000241		FQ	#	0.00005	
Uranium	mg/L	11/03/2010	N002	37.3	-	61.8	0.000165		FQ	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	9.1	-	23.3	424		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	9.1	-	23.3	2.7		F	#		
Manganese	mg/L	11/03/2010	N001	9.1	-	23.3	1.95		F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	9.1	-	23.3	1.48		F	#	0.00334	
Oxidation Reduction Potential	mV	11/03/2010	N001	9.1	-	23.3	78.4		F	#		
pH	s.u.	11/03/2010	N001	9.1	-	23.3	7		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	9.1	-	23.3	8448		F	#		
Sulfate	mg/L	11/03/2010	N001	9.1	-	23.3	4230		F	#	50	
Temperature	C	11/03/2010	N001	9.1	-	23.3	9.26		F	#		
Turbidity	NTU	11/03/2010	N001	9.1	-	23.3	0.93		F	#		
Uranium	mg/L	11/03/2010	N001	9.1	-	23.3	1.78		F	#	0.005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	9.8	-	26.8	207		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	9.8	-	26.8	1.71		F	#		
Manganese	mg/L	11/02/2010	N001	9.8	-	26.8	0.0182		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	9.8	-	26.8	0.00216	B	F	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	9.8	-	26.8	27.9		F	#		
pH	s.u.	11/02/2010	N001	9.8	-	26.8	7.47		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	9.8	-	26.8	844		F	#		
Sulfate	mg/L	11/02/2010	N001	9.8	-	26.8	146		F	#	10	
Temperature	C	11/02/2010	N001	9.8	-	26.8	13.09		F	#		
Turbidity	NTU	11/02/2010	N001	9.8	-	26.8	1.51		F	#		
Uranium	mg/L	11/02/2010	N001	9.8	-	26.8	0.00383		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	9.78	-	14.78	299		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	9.78	-	14.78	2.23		F	#		
Manganese	mg/L	11/02/2010	N001	9.78	-	14.78	0.376		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	9.78	-	14.78	0.152		F	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	9.78	-	14.78	-12.7		F	#		
pH	s.u.	11/02/2010	N001	9.78	-	14.78	7.16		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	9.78	-	14.78	1561		F	#		
Sulfate	mg/L	11/02/2010	N001	9.78	-	14.78	410		F	#	10	
Temperature	C	11/02/2010	N001	9.78	-	14.78	13.39		F	#		
Turbidity	NTU	11/02/2010	N001	9.78	-	14.78	1.69		F	#		
Uranium	mg/L	11/02/2010	N001	9.78	-	14.78	0.29		F	#	0.0005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	45.1	-	55.1	225		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	45.1	-	55.1	2.3		F	#		
Manganese	mg/L	11/02/2010	N001	45.1	-	55.1	0.179		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	45.1	-	55.1	0.00744		F	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	45.1	-	55.1	-91.1		F	#		
pH	s.u.	11/02/2010	N001	45.1	-	55.1	7.75		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	45.1	-	55.1	2155		F	#		
Sulfate	mg/L	11/02/2010	N001	45.1	-	55.1	673		F	#	10	
Temperature	C	11/02/2010	N001	45.1	-	55.1	11.47		F	#		
Turbidity	NTU	11/02/2010	N001	45.1	-	55.1	1.85		F	#		
Uranium	mg/L	11/02/2010	N001	45.1	-	55.1	0.00005	U	F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	18.24	-	23.24	416		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	18.24	-	23.24	2.93		F	#		
Manganese	mg/L	11/02/2010	N001	18.24	-	23.24	0.991		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	18.24	-	23.24	0.148		F	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	18.24	-	23.24	109.4		F	#		
pH	s.u.	11/02/2010	N001	18.24	-	23.24	7.04		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	18.24	-	23.24	6505		F	#		
Sulfate	mg/L	11/02/2010	N001	18.24	-	23.24	3050		F	#	10	
Temperature	C	11/02/2010	N001	18.24	-	23.24	14.88		F	#		
Turbidity	NTU	11/02/2010	N001	18.24	-	23.24	1.49		F	#		
Uranium	mg/L	11/02/2010	N001	18.24	-	23.24	0.297		F	#	0.0005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	38.47	-	48.47	127		FQ	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	38.47	-	48.47	1.65		FQ	#		
Manganese	mg/L	11/02/2010	N001	38.47	-	48.47	0.072		FQ	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	38.47	-	48.47	0.016		FQ	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	38.47	-	48.47	-40.4		FQ	#		
pH	s.u.	11/02/2010	N001	38.47	-	48.47	7.75		FQ	#		
Specific Conductance	umhos /cm	11/02/2010	N001	38.47	-	48.47	1343		FQ	#		
Sulfate	mg/L	11/02/2010	N001	38.47	-	48.47	426		FQ	#	10	
Temperature	C	11/02/2010	N001	38.47	-	48.47	13.18		FQ	#		
Turbidity	NTU	11/02/2010	N001	38.47	-	48.47	8.99		FQ	#		
Uranium	mg/L	11/02/2010	N001	38.47	-	48.47	0.000568		FQ	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	7.94	-	12.94	216		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	7.94	-	12.94	2.33		F	#		
Manganese	mg/L	11/03/2010	N001	7.94	-	12.94	0.017		F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	7.94	-	12.94	0.00176	B	F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	7.94	-	12.94	43		F	#		
pH	s.u.	11/03/2010	N001	7.94	-	12.94	7.31		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	7.94	-	12.94	793		F	#		
Sulfate	mg/L	11/03/2010	N001	7.94	-	12.94	176		F	#	10	
Temperature	C	11/03/2010	N001	7.94	-	12.94	11.83		F	#		
Turbidity	NTU	11/03/2010	N001	7.94	-	12.94	1.72		F	#		
Uranium	mg/L	11/03/2010	N001	7.94	-	12.94	0.00555		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	44.43	-	54.43	81		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	44.43	-	54.43	0.73		F	#		
Manganese	mg/L	11/03/2010	N001	44.43	-	54.43	0.00389	B	F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	44.43	-	54.43	0.00303		F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	44.43	-	54.43	-51		F	#		
pH	s.u.	11/03/2010	N001	44.43	-	54.43	8.86		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	44.43	-	54.43	990		F	#		
Sulfate	mg/L	11/03/2010	N001	44.43	-	54.43	283		F	#	10	
Temperature	C	11/03/2010	N001	44.43	-	54.43	10.48		F	#		
Turbidity	NTU	11/03/2010	N001	44.43	-	54.43	2.65		F	#		
Uranium	mg/L	11/03/2010	N001	44.43	-	54.43	0.000146		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	11.1	-	16.1	280		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	11.1	-	16.1	3.14		F	#		
Manganese	mg/L	11/02/2010	N001	11.1	-	16.1	0.0208		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	11.1	-	16.1	0.113		F	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	11.1	-	16.1	67.2		F	#		
pH	s.u.	11/02/2010	N001	11.1	-	16.1	6.92		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	11.1	-	16.1	2627		F	#		
Sulfate	mg/L	11/02/2010	N001	11.1	-	16.1	1110		F	#	10	
Temperature	C	11/02/2010	N001	11.1	-	16.1	14.79		F	#		
Turbidity	NTU	11/02/2010	N001	11.1	-	16.1	1.31		F	#		
Uranium	mg/L	11/02/2010	N001	11.1	-	16.1	0.759		F	#	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	45.99	-	55.99	377		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	45.99	-	55.99	5.35		F	#		
Manganese	mg/L	11/02/2010	N001	45.99	-	55.99	0.471		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	45.99	-	55.99	0.000421	B	UF	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	45.99	-	55.99	-32		F	#		
pH	s.u.	11/02/2010	N001	45.99	-	55.99	7.14		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	45.99	-	55.99	4201		F	#		
Sulfate	mg/L	11/02/2010	N001	45.99	-	55.99	1610		FJ	#	10	
Temperature	C	11/02/2010	N001	45.99	-	55.99	12.34		F	#		
Turbidity	NTU	11/02/2010	N001	45.99	-	55.99	1.55		F	#		
Uranium	mg/L	11/02/2010	N001	45.99	-	55.99	0.000097	B	UF	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	14.71	-	19.71	263		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	14.71	-	19.71	1.22		F	#		
Manganese	mg/L	11/03/2010	N001	14.71	-	19.71	0.00423	B	F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	14.71	-	19.71	0.00378		F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	14.71	-	19.71	143.4		F	#		
pH	s.u.	11/03/2010	N001	14.71	-	19.71	7.17		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	14.71	-	19.71	775		F	#		
Sulfate	mg/L	11/03/2010	N001	14.71	-	19.71	132		F	#	10	
Temperature	C	11/03/2010	N001	14.71	-	19.71	13.92		F	#		
Turbidity	NTU	11/03/2010	N001	14.71	-	19.71	1.83		F	#		
Uranium	mg/L	11/03/2010	N001	14.71	-	19.71	0.00599		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	38.62	-	48.62	336		FQ	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	38.62	-	48.62	0.25		FQ	#		
Manganese	mg/L	11/03/2010	N001	38.62	-	48.62	0.0504		FQ	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	38.62	-	48.62	0.00547		FQ	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	38.62	-	48.62	-35.6		FQ	#		
pH	s.u.	11/03/2010	N001	38.62	-	48.62	7.47		FQ	#		
Specific Conductance	umhos /cm	11/03/2010	N001	38.62	-	48.62	1063		FQ	#		
Sulfate	mg/L	11/03/2010	N001	38.62	-	48.62	174		FQ	#	10	
Temperature	C	11/03/2010	N001	38.62	-	48.62	13.44		FQ	#		
Turbidity	NTU	11/03/2010	N001	38.62	-	48.62	1.71		FQ	#		
Uranium	mg/L	11/03/2010	N001	38.62	-	48.62	0.00942		FQ	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	1.65	-	6.65	139		F	#		
Dissolved Oxygen	mg/L	11/02/2010	N001	1.65	-	6.65	1.74		F	#		
Manganese	mg/L	11/02/2010	N001	1.65	-	6.65	0.839		F	#	0.002	
Molybdenum	mg/L	11/02/2010	N001	1.65	-	6.65	0.0144		F	#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	1.65	-	6.65	-45.5		F	#		
pH	s.u.	11/02/2010	N001	1.65	-	6.65	7.55		F	#		
Specific Conductance	umhos /cm	11/02/2010	N001	1.65	-	6.65	4859		F	#		
Sulfate	mg/L	11/02/2010	N001	1.65	-	6.65	2180		F	#	10	
Temperature	C	11/02/2010	N001	1.65	-	6.65	15.07		F	#		
Turbidity	NTU	11/02/2010	N001	1.65	-	6.65	2.18		F	#		
Uranium	mg/L	11/02/2010	N001	1.65	-	6.65	0.0043		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	1.41 - 13.41	449		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	1.41 - 13.41	0.44		F	#		
Manganese	mg/L	11/03/2010	N001	1.41 - 13.41	0.195		F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	1.41 - 13.41	0.0299		F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	1.41 - 13.41	30.8		F	#		
pH	s.u.	11/03/2010	N001	1.41 - 13.41	7.18		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	1.41 - 13.41	4808		F	#		
Sulfate	mg/L	11/03/2010	N001	1.41 - 13.41	2020		F	#	10	
Temperature	C	11/03/2010	N001	1.41 - 13.41	11.14		F	#		
Turbidity	NTU	11/03/2010	N001	1.41 - 13.41	2.76		F	#		
Uranium	mg/L	11/03/2010	N001	1.41 - 13.41	0.0745		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	6.2	-	18.2	543		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	6.2	-	18.2	0.98		F	#		
Manganese	mg/L	11/03/2010	N001	6.2	-	18.2	0.347		F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	6.2	-	18.2	0.723		F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	6.2	-	18.2	44.8		F	#		
pH	s.u.	11/03/2010	N001	6.2	-	18.2	7.12		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	6.2	-	18.2	13744		F	#		
Sulfate	mg/L	11/03/2010	N001	6.2	-	18.2	6890		F	#	50	
Temperature	C	11/03/2010	N001	6.2	-	18.2	11.66		F	#		
Turbidity	NTU	11/03/2010	N001	6.2	-	18.2	1.05		F	#		
Uranium	mg/L	11/03/2010	N001	6.2	-	18.2	2.64		F	#	0.005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	9.5	-	14.5	342		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	9.5	-	14.5	0.57		F	#		
Manganese	mg/L	11/03/2010	N001	9.5	-	14.5	0.00534	B	F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	9.5	-	14.5	0.00503		F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	9.5	-	14.5	56.9		F	#		
pH	s.u.	11/03/2010	N001	9.5	-	14.5	7.21		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	9.5	-	14.5	1013		F	#		
Sulfate	mg/L	11/03/2010	N001	9.5	-	14.5	169		F	#	10	
Temperature	C	11/03/2010	N001	9.5	-	14.5	12.89		F	#		
Turbidity	NTU	11/03/2010	N001	9.5	-	14.5	1.1		F	#		
Uranium	mg/L	11/03/2010	N001	9.5	-	14.5	0.0178		F	#	0.00005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	6.6	-	11.6	472		F	#		
Dissolved Oxygen	mg/L	11/03/2010	N001	6.6	-	11.6	0.51		F	#		
Manganese	mg/L	11/03/2010	N001	6.6	-	11.6	2.47		F	#	0.002	
Molybdenum	mg/L	11/03/2010	N001	6.6	-	11.6	0.0468		F	#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	6.6	-	11.6	30.3		F	#		
pH	s.u.	11/03/2010	N001	6.6	-	11.6	7.13		F	#		
Specific Conductance	umhos /cm	11/03/2010	N001	6.6	-	11.6	4519		F	#		
Sulfate	mg/L	11/03/2010	N001	6.6	-	11.6	1820		F	#	10	
Temperature	C	11/03/2010	N001	6.6	-	11.6	11.5		F	#		
Turbidity	NTU	11/03/2010	N001	6.6	-	11.6	1.84		F	#		
Uranium	mg/L	11/03/2010	N001	6.6	-	11.6	0.0784		F	#	0.00005	

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

LAB QUALIFIERS:
- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated

N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

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

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

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Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	0001	377			#		
Manganese	mg/L	11/03/2010	0001	2.45			#	0.002	
Molybdenum	mg/L	11/03/2010	0001	0.0251			#	0.000167	
Sulfate	mg/L	11/03/2010	0001	2080			#	10	
Uranium	mg/L	11/03/2010	0001	0.543			#	0.0005	
Dissolved Oxygen	mg/L	11/03/2010	N001	0.83			#		
Oxidation Reduction Potential	mV	11/03/2010	N001	122.4			#		
pH	s.u.	11/03/2010	N001	7.87			#		
Specific Conductance	umhos/cm	11/03/2010	N001	4868			#		
Temperature	C	11/03/2010	N001	5.64			#		
Turbidity	NTU	11/03/2010	N001	17.48			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/02/2010	N001	62			#		
Dissolved Oxygen	mg/L	11/02/2010	N001	7.35			#		
Manganese	mg/L	11/02/2010	N001	0.153			#	0.002	
Molybdenum	mg/L	11/02/2010	N001	0.0242			#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	49.5			#		
pH	s.u.	11/02/2010	N001	7.76			#		
Specific Conductance	umhos/cm	11/02/2010	N001	4834			#		
Sulfate	mg/L	11/02/2010	N001	2690			#	10	
Temperature	C	11/02/2010	N001	21.46			#		
Turbidity	NTU	11/02/2010	N001	9.91			#		
Uranium	mg/L	11/02/2010	N001	0.00427			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	186			#		
Dissolved Oxygen	mg/L	11/03/2010	N001	11.65			#		
Manganese	mg/L	11/03/2010	N001	0.0426			#	0.002	
Molybdenum	mg/L	11/03/2010	N001	0.00169	B		#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	109			#		
pH	s.u.	11/03/2010	N001	8.41			#		
Specific Conductance	umhos/cm	11/03/2010	N001	1063			#		
Sulfate	mg/L	11/03/2010	N001	309			#	10	
Temperature	C	11/03/2010	N001	9.86			#		
Turbidity	NTU	11/03/2010	N001	9.78			#		
Uranium	mg/L	11/03/2010	N001	0.00831			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	190			#		
Manganese	mg/L	11/03/2010	N001	0.0388			#	0.002	
Molybdenum	mg/L	11/03/2010	N001	0.00169	B		#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	113.3			#		
pH	s.u.	11/03/2010	N001	8.53			#		
Specific Conductance	umhos/cm	11/03/2010	N001	1071			#		
Sulfate	mg/L	11/03/2010	N001	307			#	10	
Temperature	C	11/03/2010	N001	10.83			#		
Turbidity	NTU	11/03/2010	N001	8			#		
Uranium	mg/L	11/03/2010	N001	0.00765			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	373			#		
Manganese	mg/L	11/03/2010	N001	0.0405			#	0.002	
Molybdenum	mg/L	11/03/2010	N001	0.00272	B		#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	88.2			#		
pH	s.u.	11/03/2010	N001	8.82			#		
Specific Conductance	umhos/cm	11/03/2010	N001	1592			#		
Sulfate	mg/L	11/03/2010	N001	329			#	10	
Temperature	C	11/03/2010	N001	8.63			#		
Turbidity	NTU	11/03/2010	N001	2.09			#		
Uranium	mg/L	11/03/2010	N001	0.00931			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
Location: 0811 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	11/03/2010	N001	208			#		
Dissolved Oxygen	mg/L	11/03/2010	N001	10.17			#		
Manganese	mg/L	11/03/2010	N001	0.0387			#	0.002	
Molybdenum	mg/L	11/03/2010	N001	0.00168	B		#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	95.5			#		
pH	s.u.	11/03/2010	N001	8.41			#		
Specific Conductance	umhos/cm	11/03/2010	N001	1139			#		
Sulfate	mg/L	11/03/2010	N001	311			#	10	
Temperature	C	11/03/2010	N001	10.65			#		
Turbidity	NTU	11/03/2010	N001	9.68			#		
Uranium	mg/L	11/03/2010	N001	0.00745			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
Location: 0812 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	11/03/2010	N001	188			#		
Manganese	mg/L	11/03/2010	N001	0.0448			#	0.002	
Molybdenum	mg/L	11/03/2010	N001	0.00196	B		#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	97.4			#		
pH	s.u.	11/03/2010	N001	8.43			#		
Specific Conductance	umhos/cm	11/03/2010	N001	1060			#		
Sulfate	mg/L	11/03/2010	N001	308			#	10	
Temperature	C	11/03/2010	N001	9.09			#		
Turbidity	NTU	11/03/2010	N001	7.96			#		
Uranium	mg/L	11/03/2010	N001	0.00826			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
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 CaCO3)	mg/L	11/03/2010	N001	197			#		
Manganese	mg/L	11/03/2010	N001	0.0351			#	0.002	
Molybdenum	mg/L	11/03/2010	N001	0.00746			#	0.000167	
Oxidation Reduction Potential	mV	11/03/2010	N001	68.2			#		
pH	s.u.	11/03/2010	N001	8.1			#		
Radium-226	pCi/L	11/03/2010	N001	0.889			#	0.213	0.369
Radium-228	pCi/L	11/03/2010	N001	0.517	U		#	0.517	0.35
Specific Conductance	umhos/cm	11/03/2010	N001	2594			#		
Sulfate	mg/L	11/03/2010	N001	1080			#	10	
Temperature	C	11/03/2010	N001	10.86			#		
Turbidity	NTU	11/03/2010	N001	1.69			#		
Uranium	mg/L	11/03/2010	N001	0.0103			#	0.00005	
Manganese	mg/L	11/03/2010	N002	0.035			#	0.002	
Molybdenum	mg/L	11/03/2010	N002	0.00732			#	0.000167	
Radium-226	pCi/L	11/03/2010	N002	0.498		J	#	0.326	0.282
Radium-228	pCi/L	11/03/2010	N002	0.762		J	#	0.481	0.416
Sulfate	mg/L	11/03/2010	N002	1100			#	10	
Uranium	mg/L	11/03/2010	N002	0.0105			#	0.00005	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010
Location: 0823 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	11/02/2010	N001	139			#		
Manganese	mg/L	11/02/2010	N001	0.053			#	0.002	
Molybdenum	mg/L	11/02/2010	N001	0.00196	B		#	0.000167	
Oxidation Reduction Potential	mV	11/02/2010	N001	47.9			#		
pH	s.u.	11/02/2010	N001	8.66			#		
Specific Conductance	umhos/cm	11/02/2010	N001	1846			#		
Sulfate	mg/L	11/02/2010	N001	510			#	10	
Temperature	C	11/02/2010	N001	10.92			#		
Turbidity	NTU	11/02/2010	N001	4.82			#		
Uranium	mg/L	11/02/2010	N001	0.00389			#	0.00005	

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

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

DATA QUALIFIERS:

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

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0101	O	4946.58	11/02/2010	14:26:00	10.06	4936.52	
0110	O	4944.35	11/02/2010	14:28:00	9.9	4934.45	
0111	O	4946.87	11/02/2010	13:36:00	9.96	4936.91	
0700	U	4951.38	11/03/2010	13:22:00	6.1	4945.28	
0702	D	4931	11/03/2010	09:16:00	6.42	4924.58	
0705	D	4930.8	11/03/2010	09:15:15	6.55	4924.25	
0707	D	4931	11/03/2010	09:30:25	5.65	4925.35	
0709	D	4930.7	11/02/2010	15:51:00	2	4928.7	
0710	U	4947.9	11/02/2010	13:55:03	5.78	4942.12	
0716	O	4939.12	11/02/2010	16:12:45	9	4930.12	
0717	O	4938.8	11/02/2010	16:00:35	8.74	4930.06	
0718	D	4937.6	11/02/2010	13:07:25	8.18	4929.42	
0719	D	4937.55	11/02/2010	13:25:46	7.75	4929.8	
0720	C	4940.46	11/03/2010	17:51:12	5.22	4935.24	
0721	C	4940.47	11/03/2010	17:40:05	7.91	4932.56	
0722R		4937.06	11/02/2010	12:40:17	9.35	4927.71	
0723	D	4936.01	11/02/2010	12:25:40	8.15	4927.86	
0724	U	4941.36	11/02/2010	15:26:00	7.88	4933.48	
0725	U	4941.66	11/02/2010	14:33:00	8.19	4933.47	
0726	U	4942	11/02/2010	15:25:00	6.81	4935.19	
0727	U	4951.69	11/02/2010	15:33:00	10.29	4941.4	
0728	U	4946.01	11/02/2010	15:26:00	8.63	4937.38	
0729	D	4932.75	11/03/2010	15:20:52	6.99	4925.76	
0730	D	4933.08	11/03/2010	15:35:17	7.56	4925.52	
0732	U	4945.07	11/02/2010	13:35:00	7.93	4937.14	
0733	U	4946.76	11/03/2010	09:18:00			D
0734	U	4946.08	11/03/2010	13:21:00	8.84	4937.24	
0736	U	4946	11/02/2010	15:37:00	6.75	4939.25	
0784	U	4945.45	11/02/2010	14:30:51	6.61	4938.84	

STATIC WATER LEVELS (USEE700) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 12/20/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0788	C	4935.09	11/03/2010	12:05:14	8.96	4926.13	
0789	D	4933.66	11/03/2010	10:55:14	9	4924.66	
0824		4928.27	11/03/2010	16:10:36	5.19	4923.08	
0826		4936.98	11/03/2010	12:45:51	7.67	4929.31	

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

WATER LEVEL FLAGS: D Dry F FLOWING

Hydrographs

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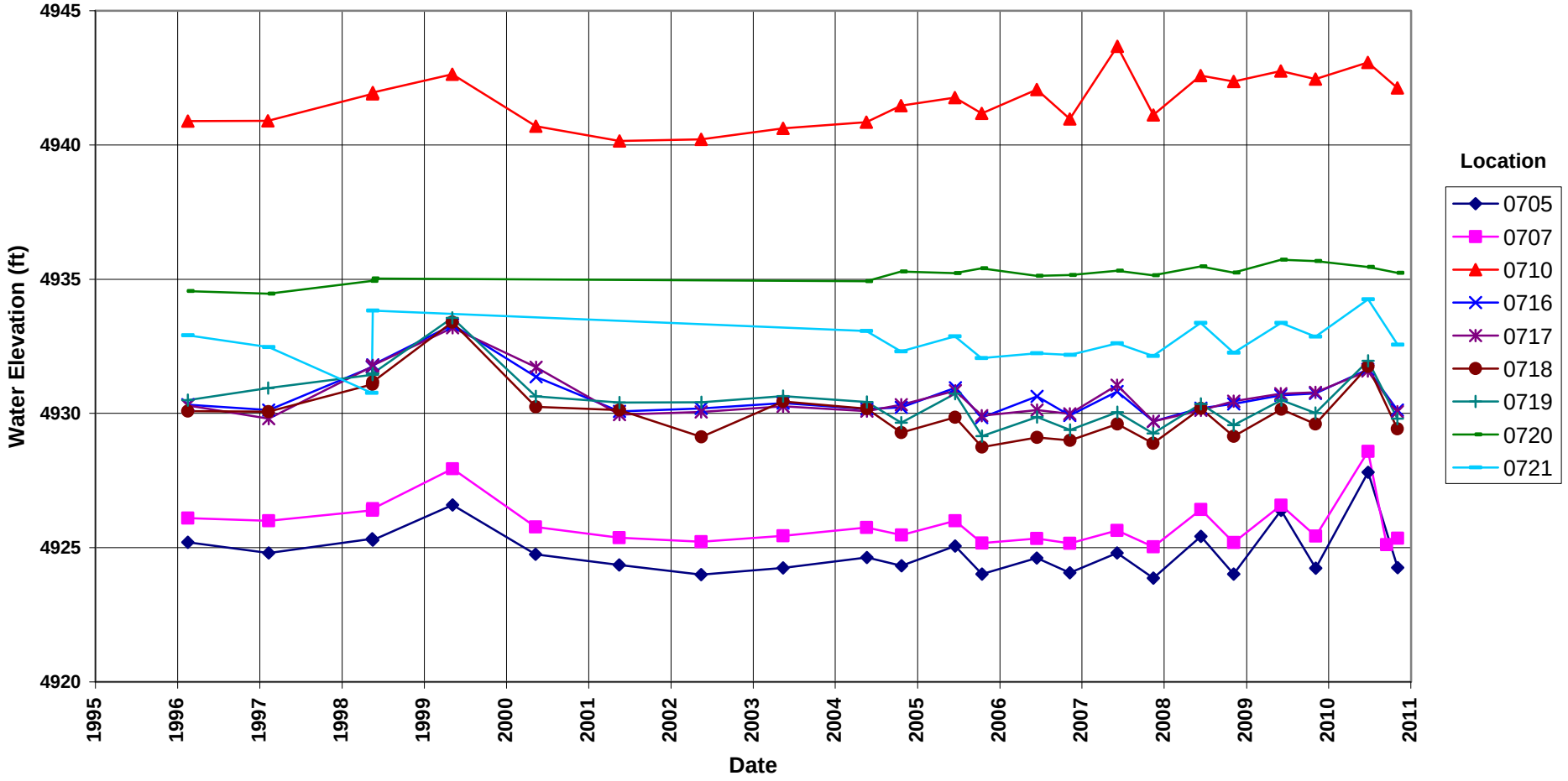
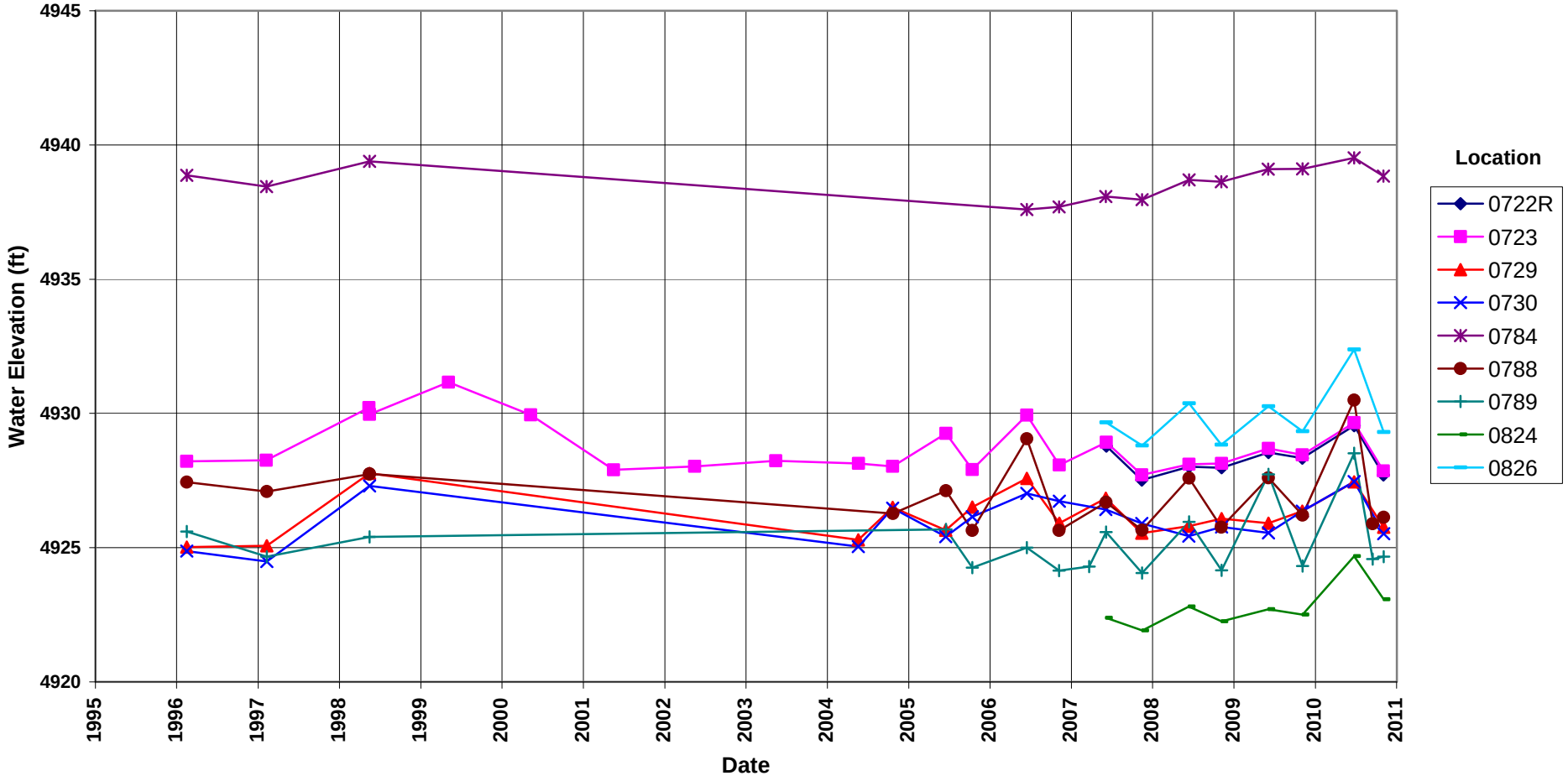
Riverton Processing Site
Hydrograph



Riverton Processing Site
Hydrograph



Time-Concentration Graphs

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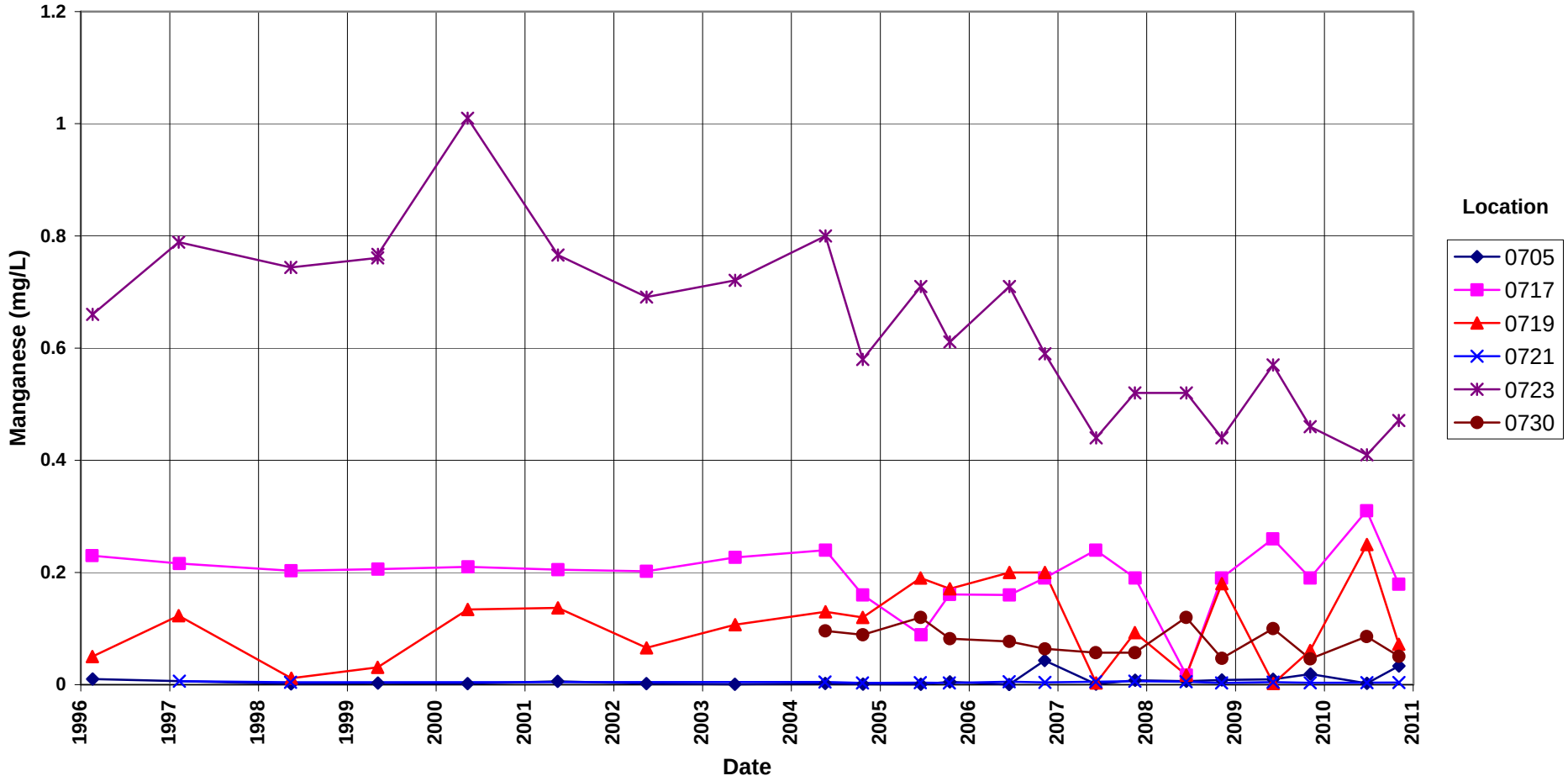
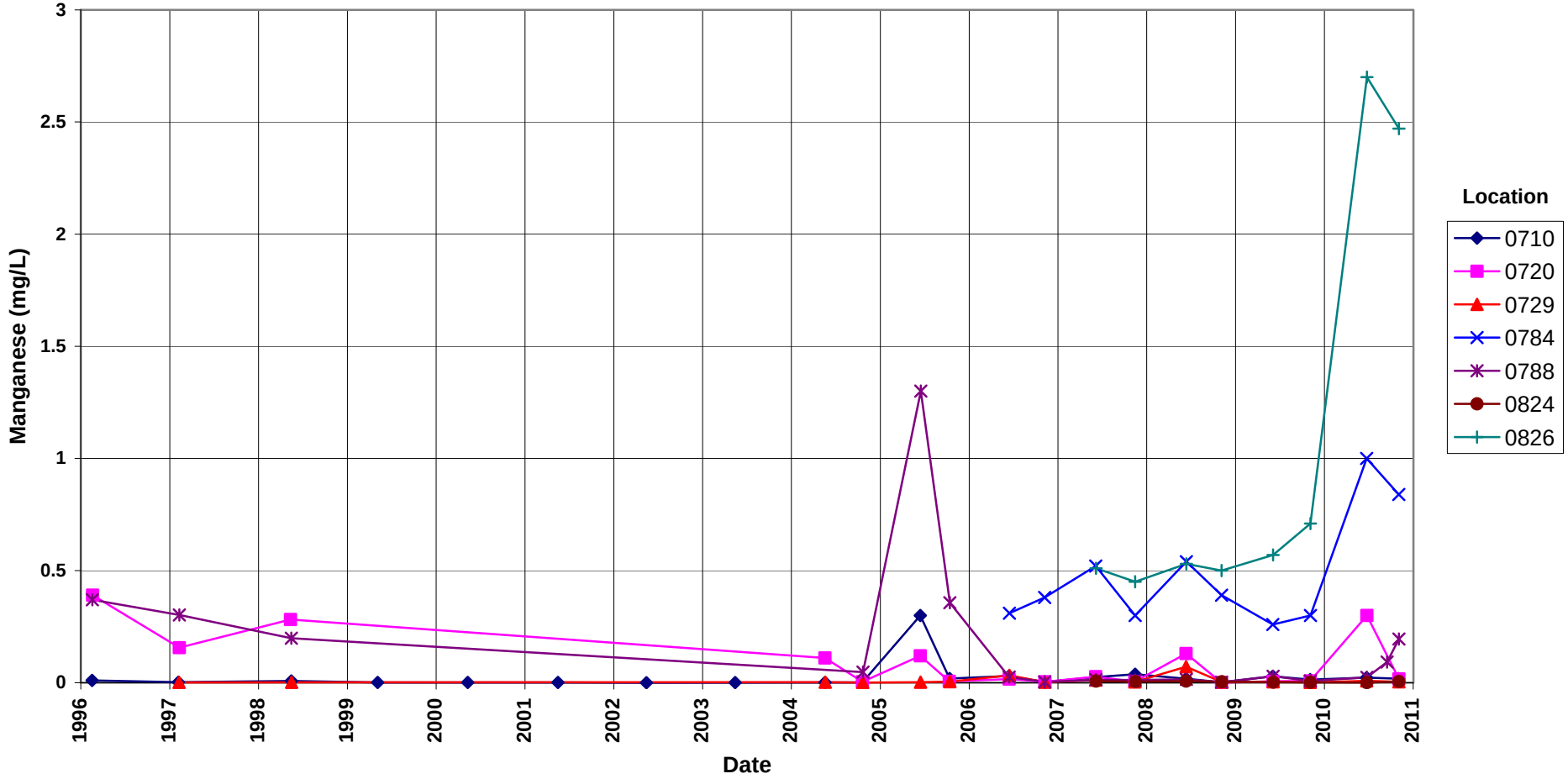
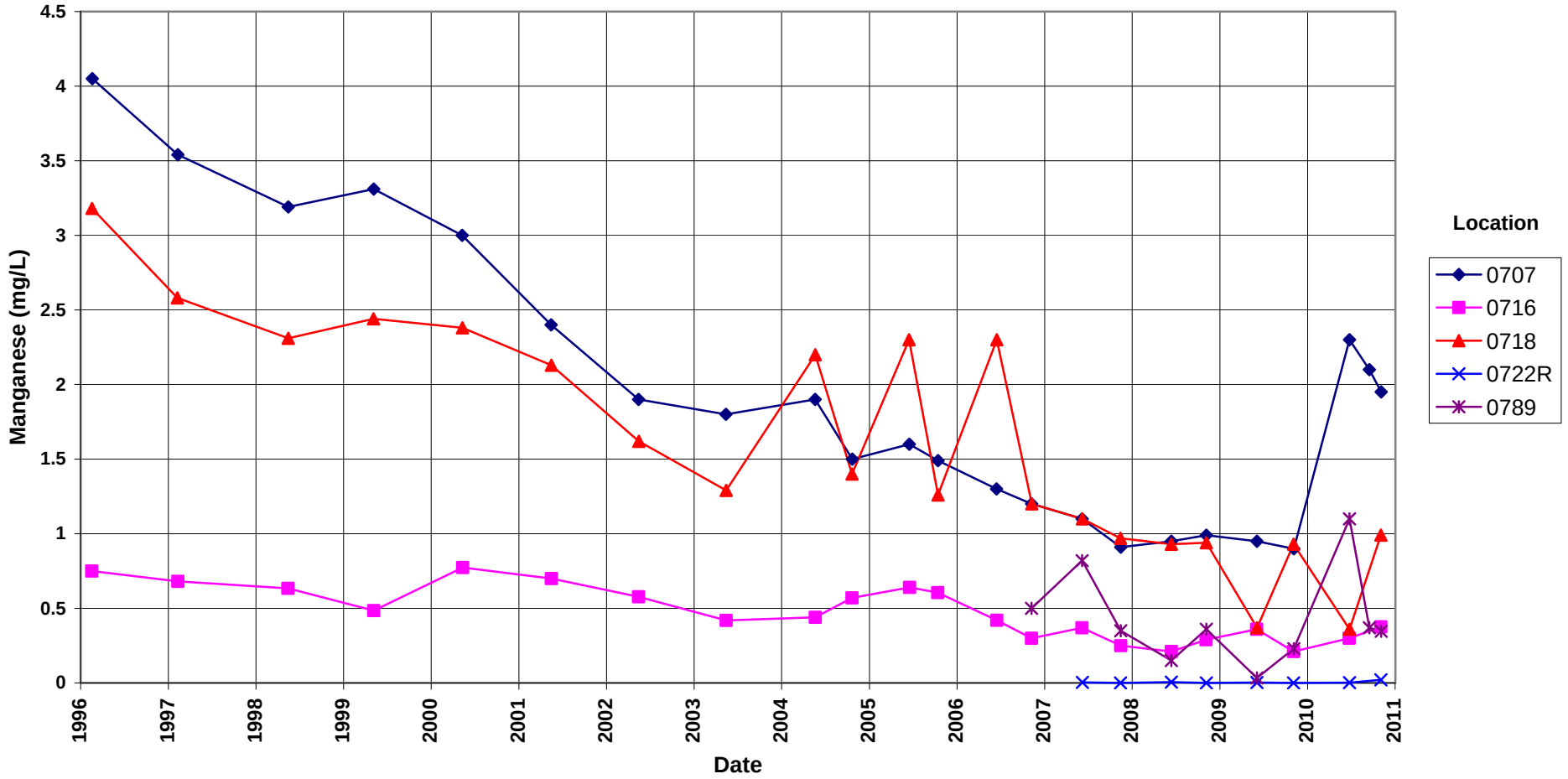
Riverton Processing Site
Manganese Concentration
Semi-Confined Aquifer Locations



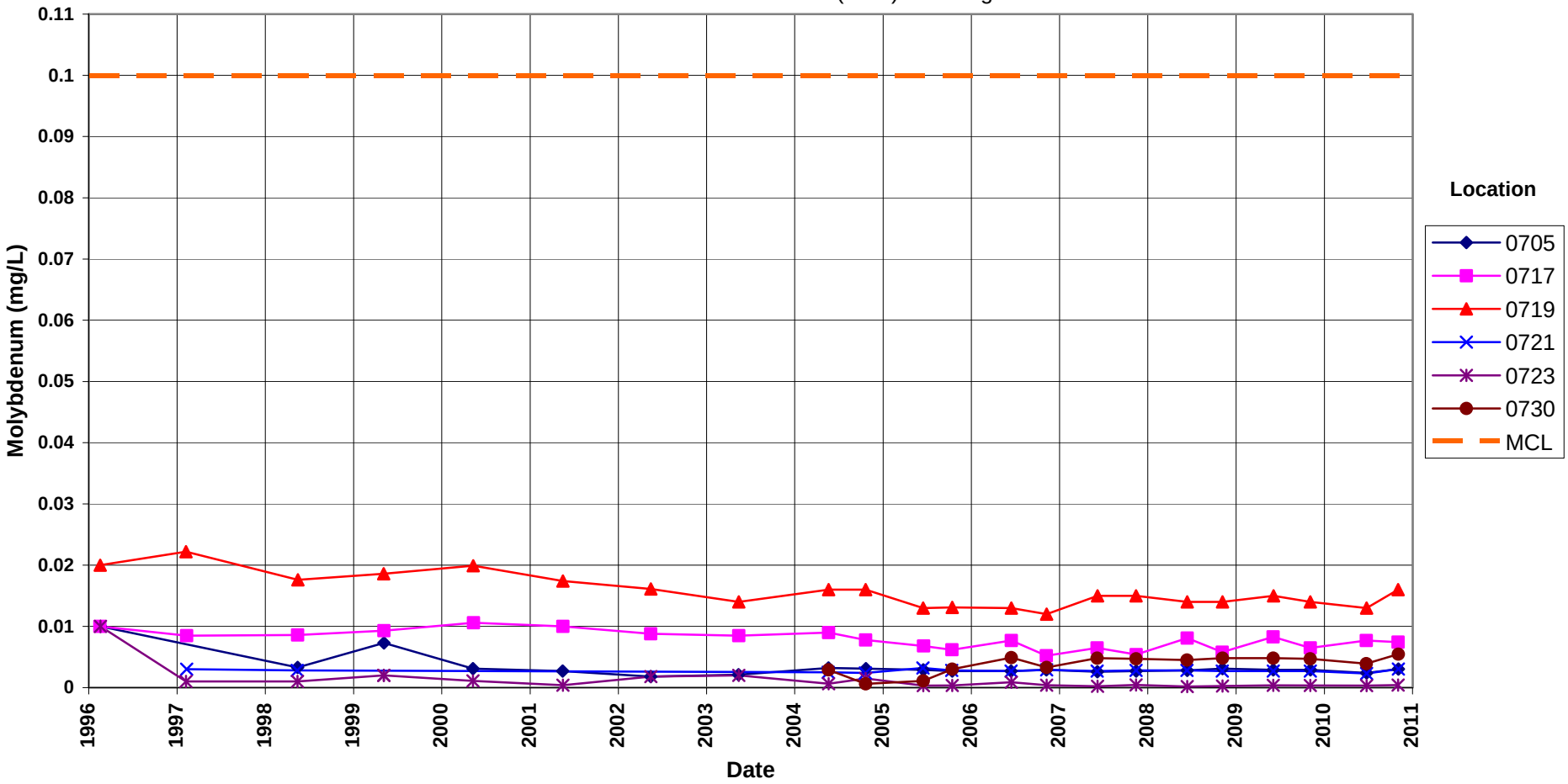
Riverton Processing Site
Manganese Concentration
Surficial Aquifer Locations



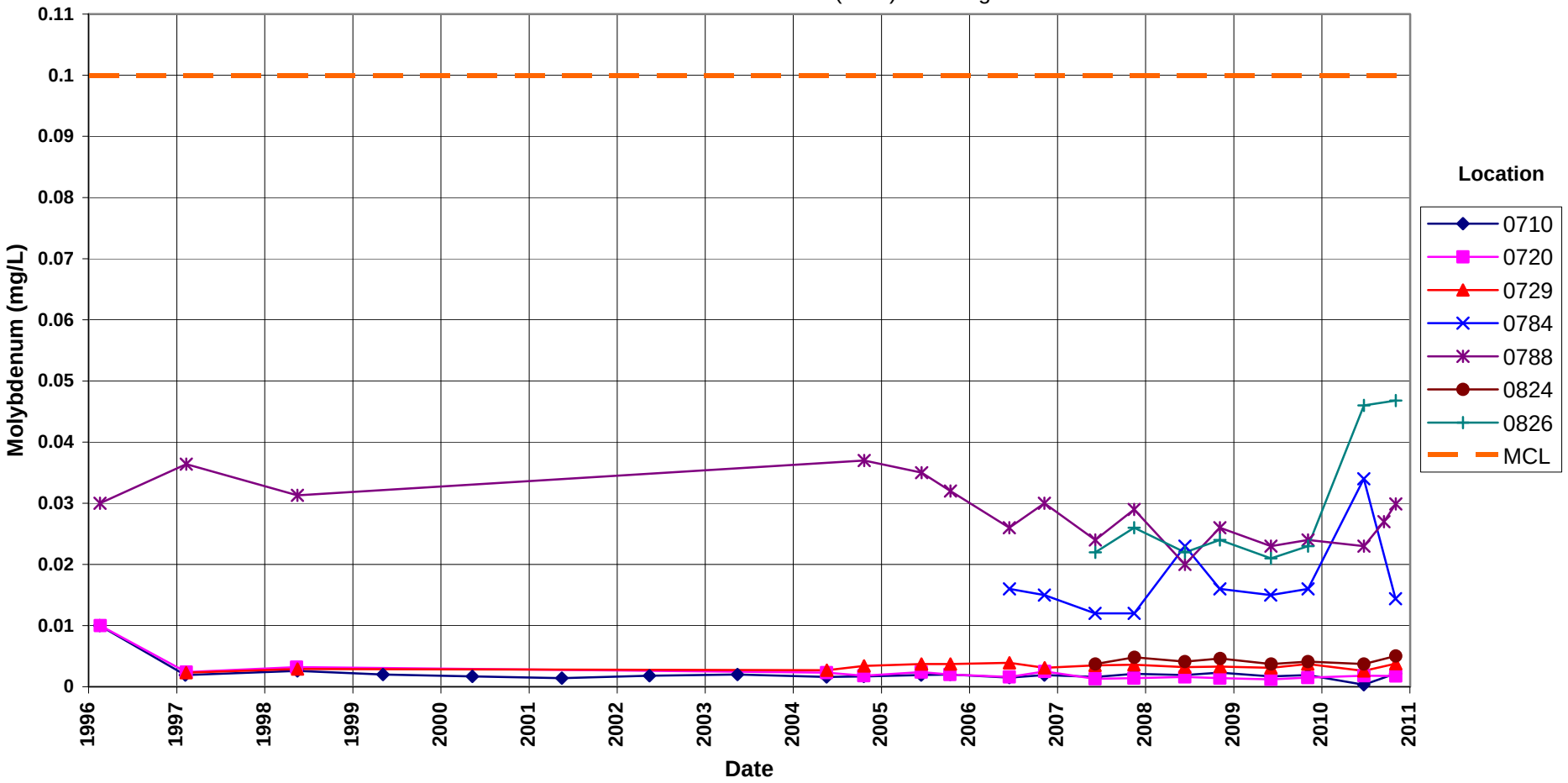
Riverton Processing Site
Manganese Concentration
Surficial Aquifer Locations



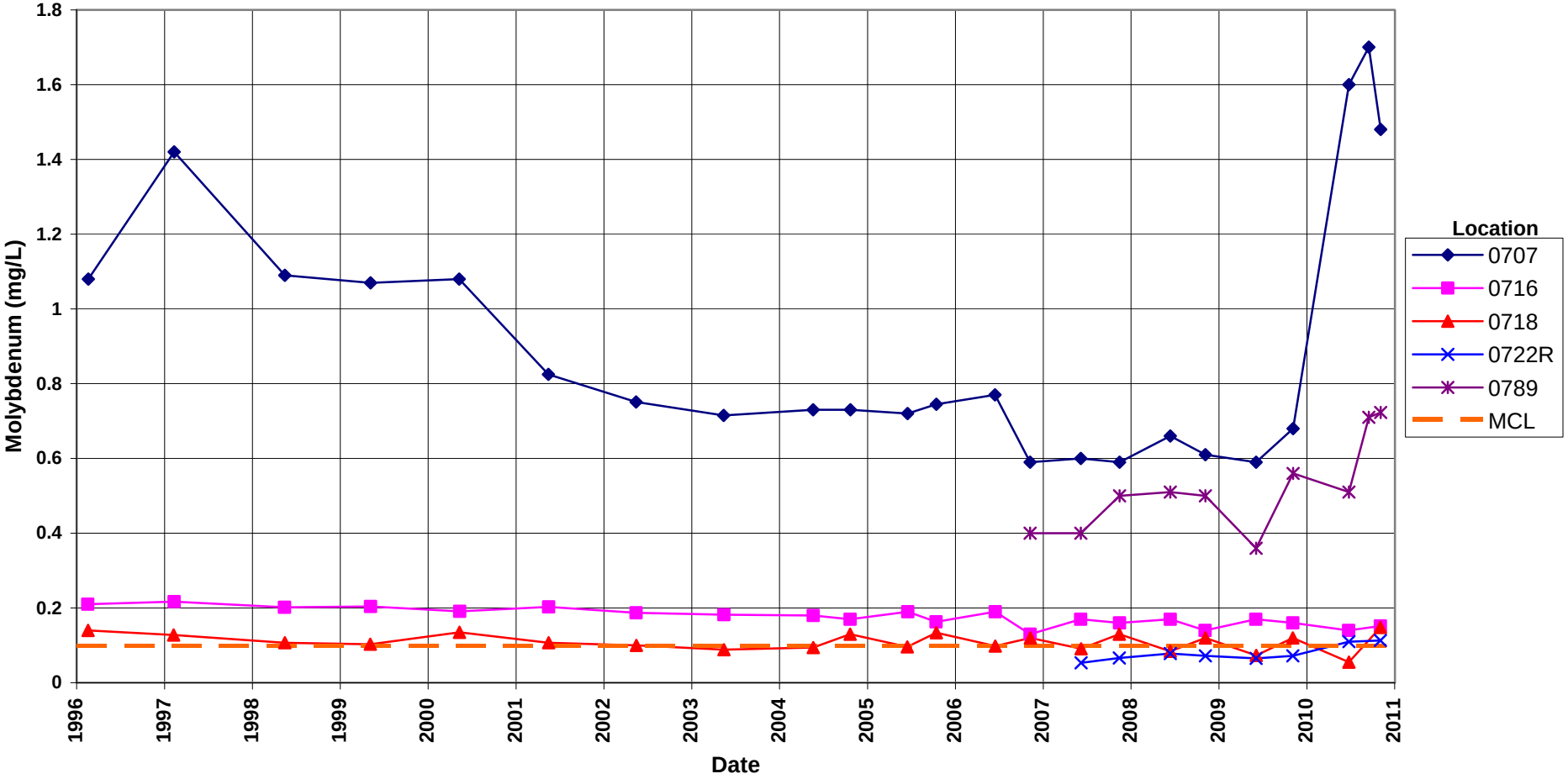
Riverton Processing Site
Molybdenum Concentration
Semi-confined Aqifer Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L



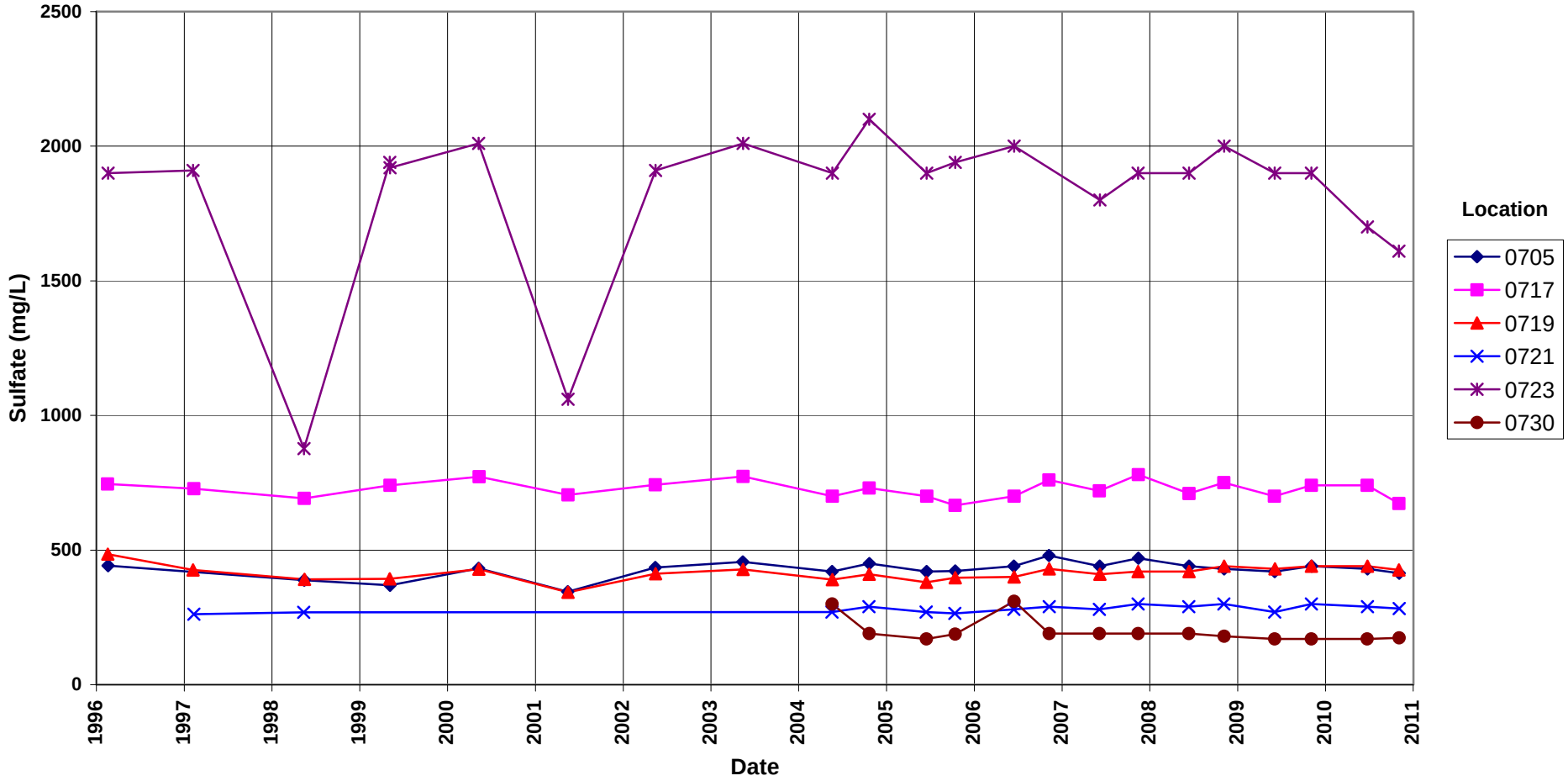
Riverton Processing Site
Molybdenum Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L



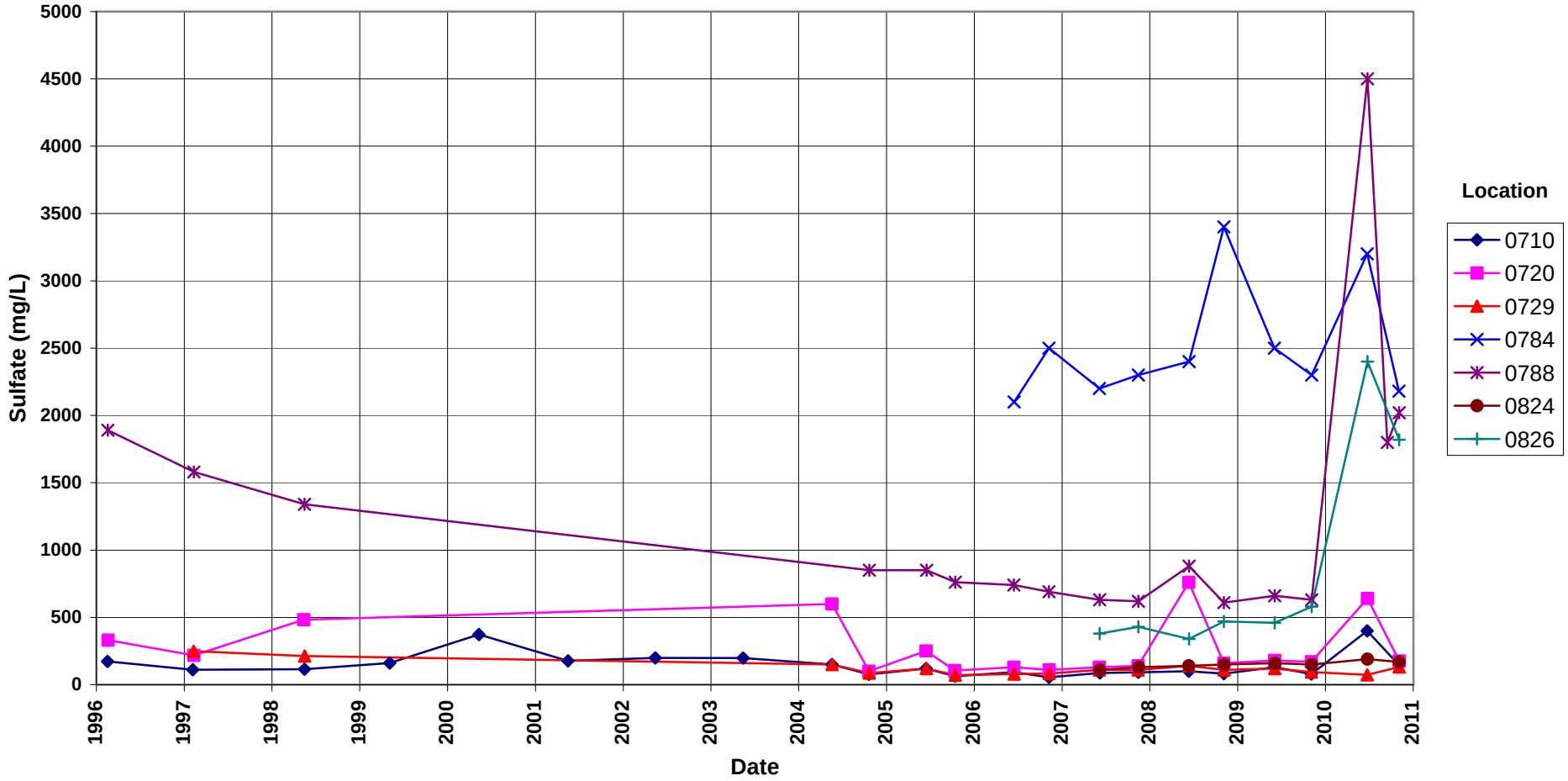
Riverton Processing Site
Molybdenum Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.1 mg/L



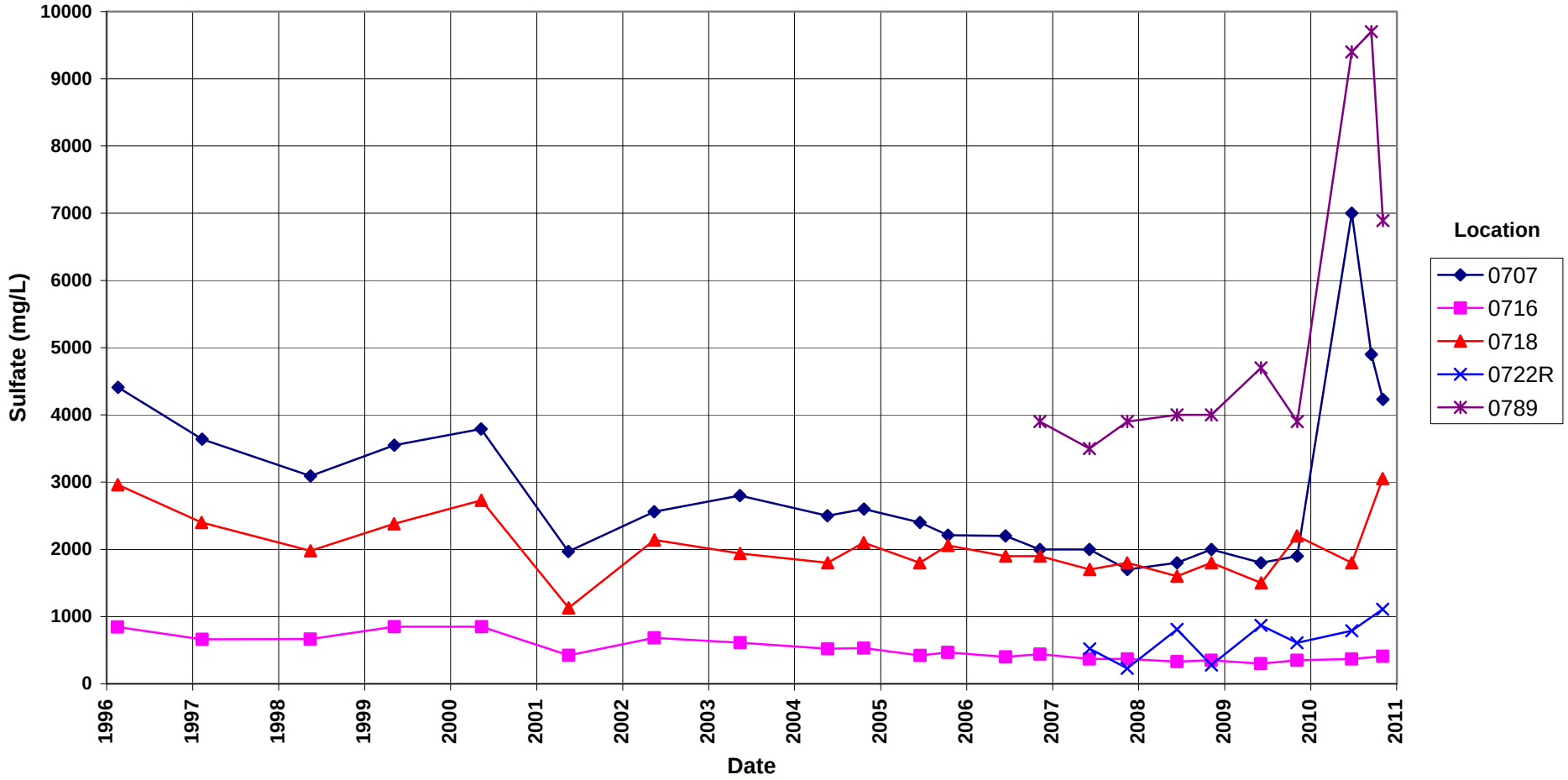
Riverton Processing Site
Sulfate Concentration
Semi-Confined Aquifer Locations

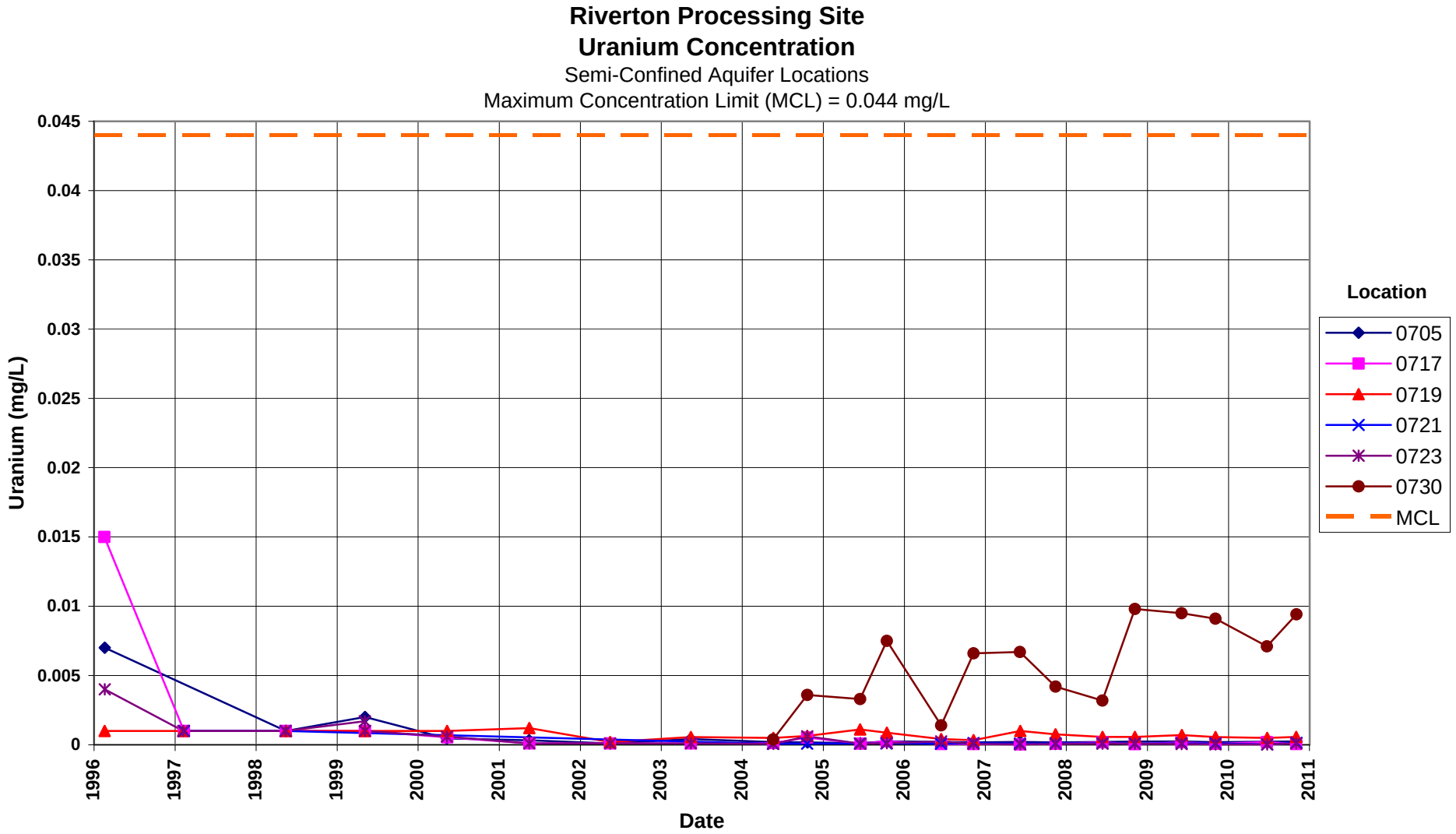


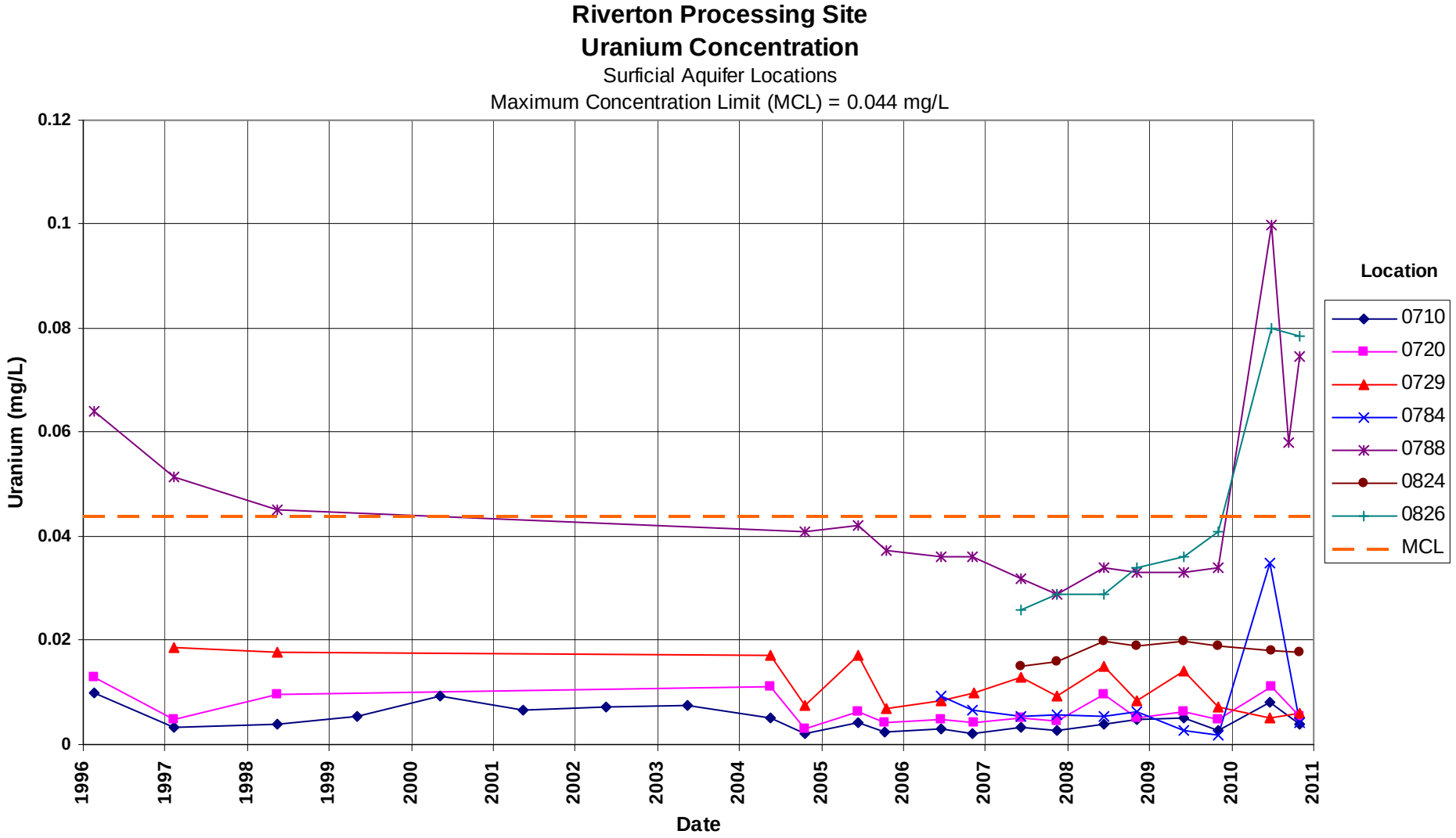
Riverton Processing Site
Sulfate Concentration
Surficial Aquifer Locations

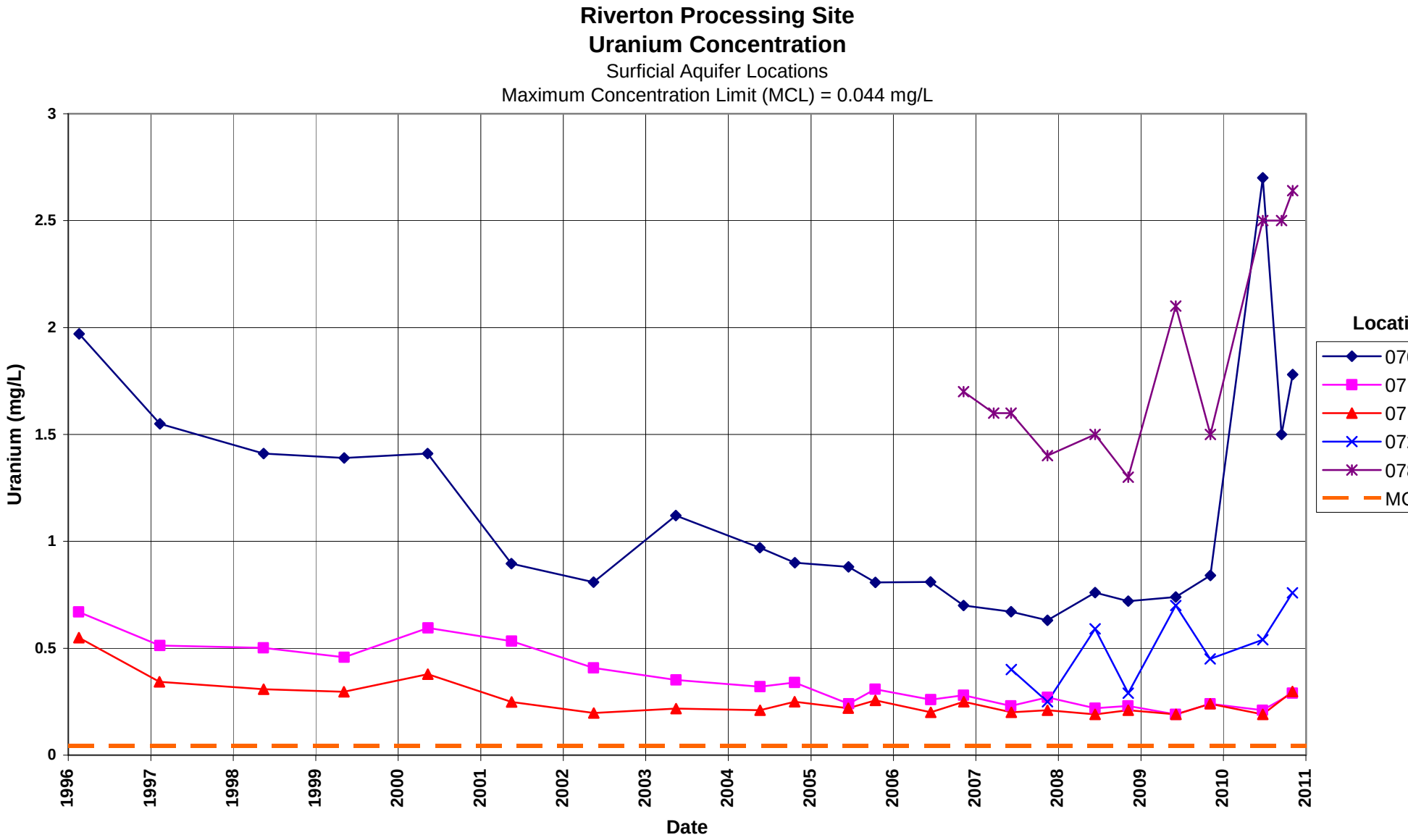


Riverton Processing Site
Sulfate Concentration
Surficial Aquifer Locations

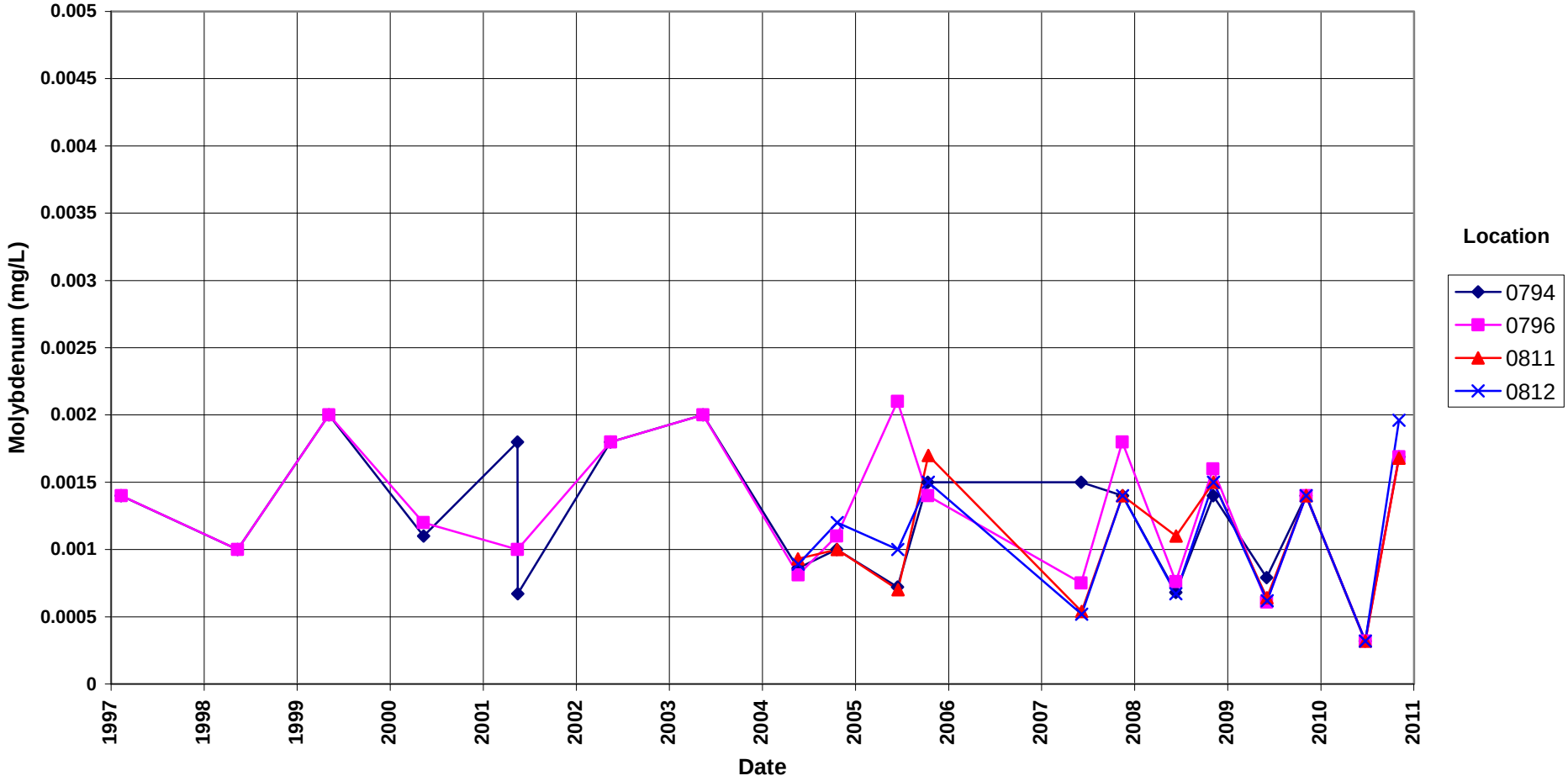



Riverton Processing Site
Uranium Concentration
Semi-Confined Aquifer Locations
Maximum Concentration Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0705
0717
0719
0721
0723
0730
MCL

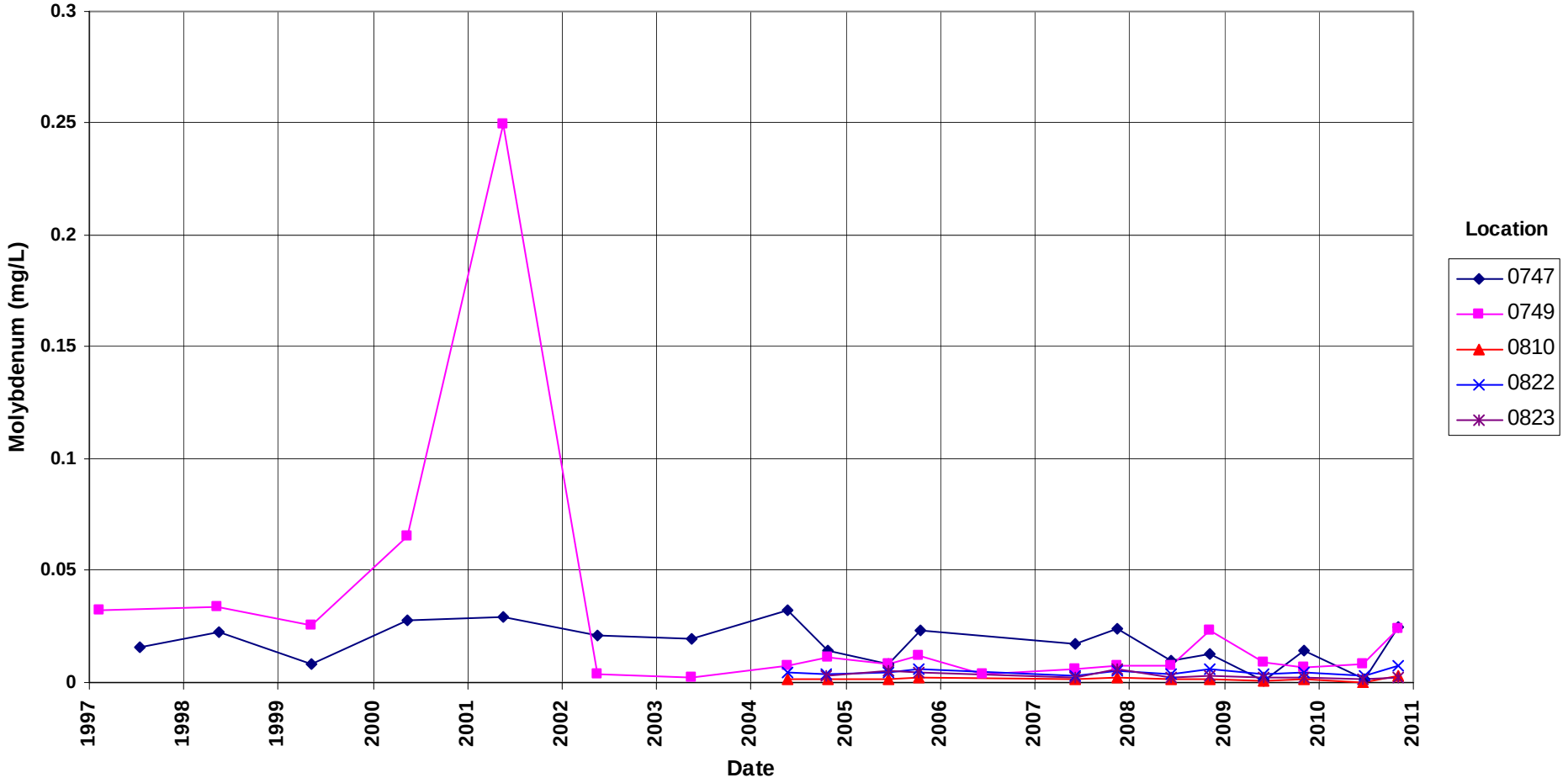

Riverton Processing Site
Uranium Concentration
Surficial Aquifer Locations
Maximum Concentration Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0710
0720
0729
0784
0788
0824
0826
MCL


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
Date
Locati
07
07
07
07
07
MC

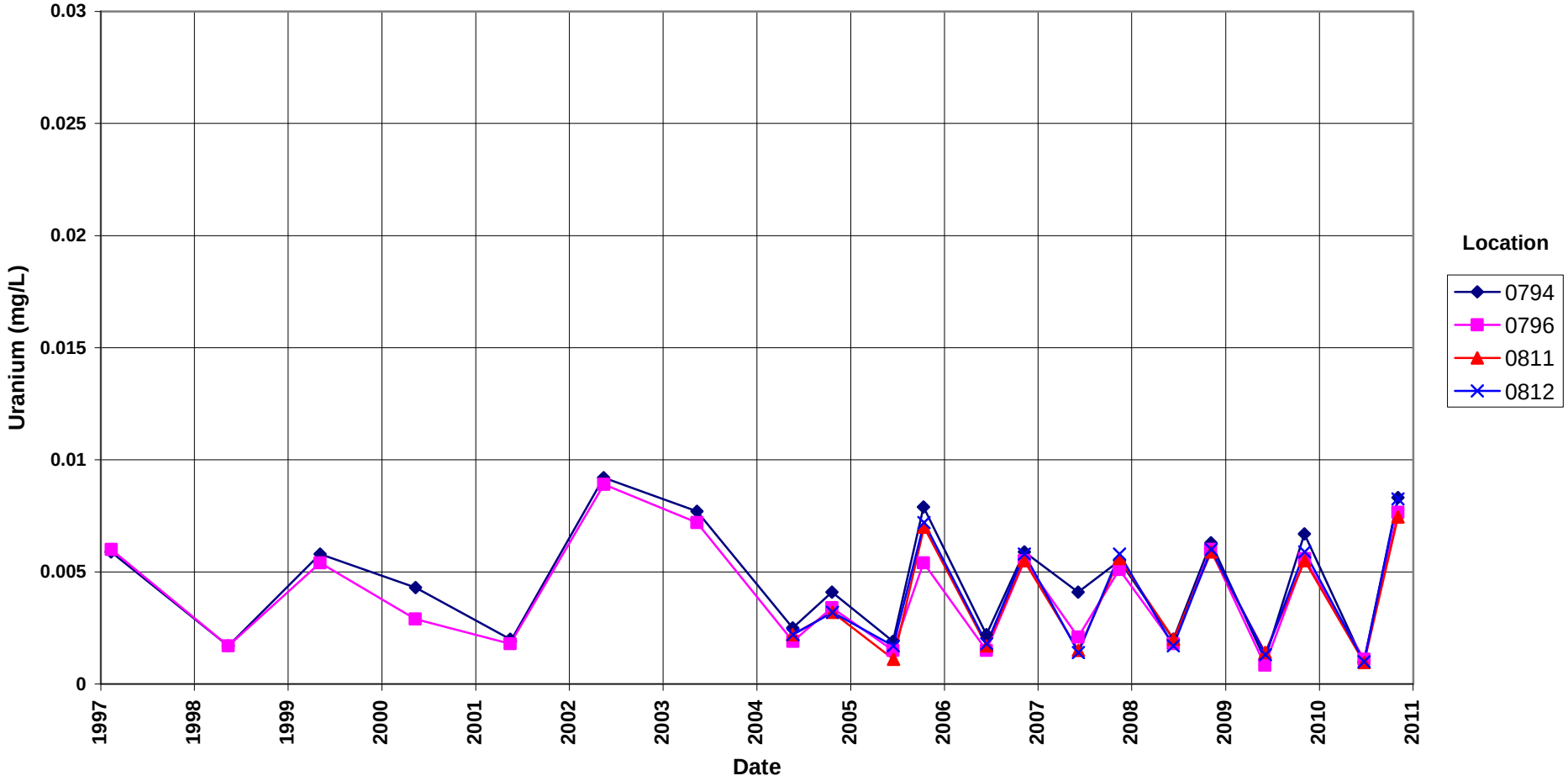
Riverton Processing Site
Molybdenum Concentration
Little Wind River Surface Water Locations



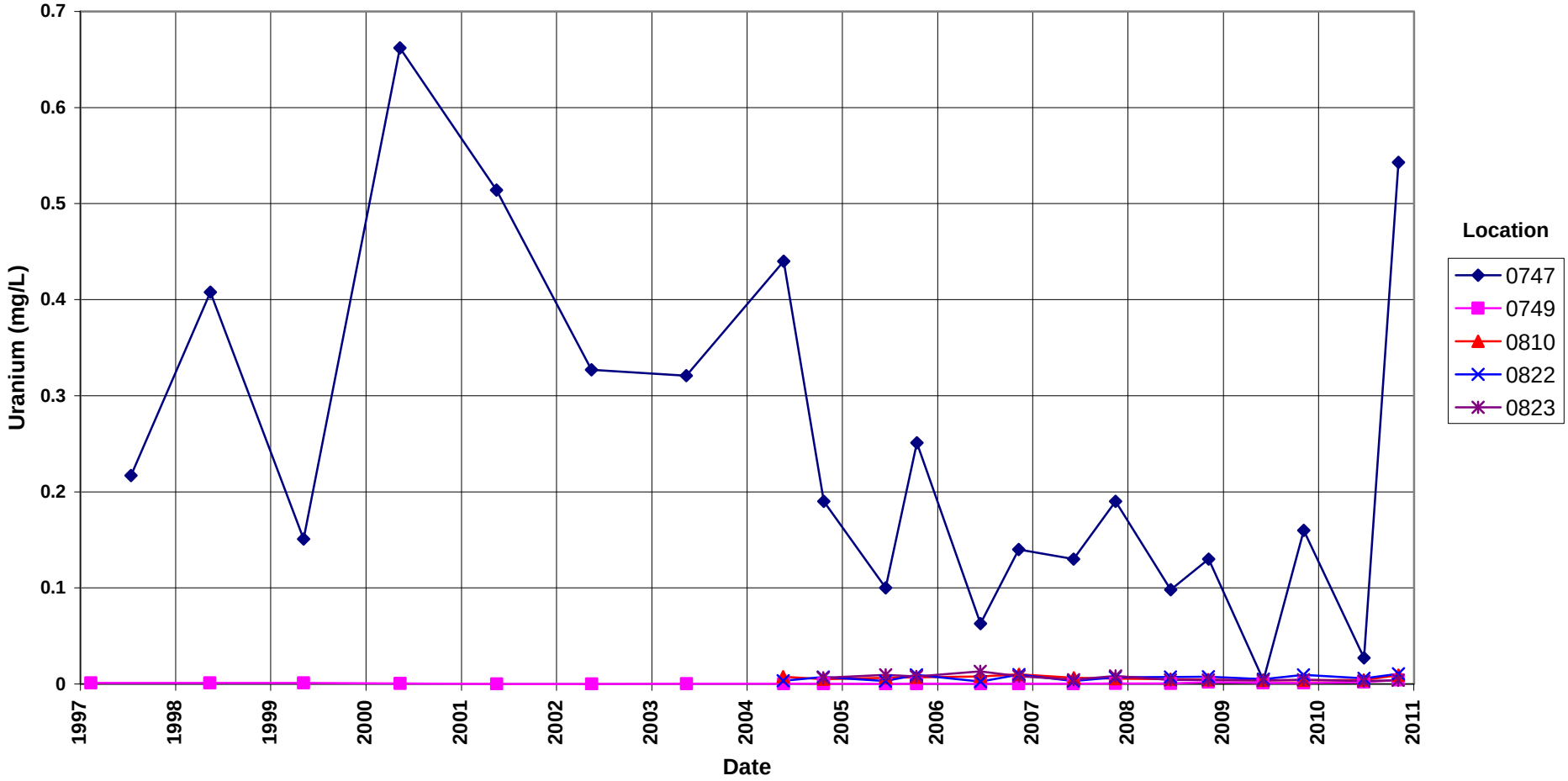
Riverton Processing Site
Molybdenum Concentration
Oxbow Lake, Wetlands, Ditch & Pond Surface Water Locations



Riverton Processing Site
Uranium Concentration
Little Wind River Surface Water Locations



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



Attachment 3
Sampling and Analysis Work Order

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Stoller established 1959

Task Order LM00-501
Control Number 11-0014

October 7, 2010

U.S. Department of Energy
Office of Legacy Management
ATTN: Dr. April Gil
Site Manager
2597 B ¾ Road
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
November 2010 Environmental Sampling at Riverton, Wyoming

REFERENCE: Task Order LM-501-02-117-402, Riverton, WY, 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 routine monitoring at the Riverton, WY, Processing Site. Water quality data will be collected from monitoring wells, domestic wells, and surface locations at this site as part of the environmental sampling currently scheduled to begin the week of November 1, 2010.

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	430	436	460	828

The S.M. Stoller Corporation 2597 B ¾ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

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 or concerns.

Sincerely,

Sam Campbell
Site Lead

SC/lcg/lb

Enclosures (3)

cc: (electronic)
Cheri Bahrke, Stoller
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction
File: RVT 410.02(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				
825					X	Not drilled yet
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
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					
Dissolved Oxygen					
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 analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

Attachment 4
Trip Report

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Stoller established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: November 23, 2010

TO: Sam Campbell

FROM: Dan Sellers

SUBJECT: Trip Report

Site: Riverton, Wyoming, Processing Site.

Dates of Sampling Event: November 2 to November 4, 2010.

Team Members: Dan Sellers and Joe Trevino.

Number of Locations Sampled: 18 monitoring wells, 9 surface water locations, and 4 domestic wells.

Locations Not Sampled/Reason: Domestic well 0828 was not sampled because the tap had been shut off and winterized.

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.

At the time of sampling, the Little Wind River was not at flood stage and water was not flowing through the Oxbow Lake.

Field Variance: Surface location 0747 (Oxbow sample) was filtered.

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

False ID	True ID	Sample Type	Ticket Number
2644	0705	Duplicate	ILW 844
2645	0822	Duplicate	ILW 845

Requisition Numbers Assigned: All samples were assigned to report identification number (RIN) 10103411 and were shipped to GEL Laboratories in Charleston, South Carolina, on November 5, 2010.

Water Level Measurements: Water levels were measured at all sampled monitoring wells and 14 additional monitoring wells.

Well Inspection Summary: All wells were in good condition.

Equipment: All equipment functioned properly.

Stakeholder/Regulatory: The Wind River Environmental Quality Commission (WREQC) observed sampling activities and split samples at monitoring wells 0707, 0710, 0784, 0788, 0789 and 0826.

Institutional Controls

Fences, Gates, Locks: No issues identified.
Signs: Warning signs installed around the Oxbow Lake were intact.
Trespassing/Site Disturbances: None.

Access Issues: New phone numbers were obtained to contact owners of domestic well 0430: Lawrence Raymond (307) 851-3965 or Brent Raymond (307) 840-6243. New access to wells and surface location in the Chem Trade area has been approved by Leon (Chem Trade Employee).

Corrective Action Required/Taken: A request has been made to notify Chem Trade (Leon) prior to entering their property and use the gate for access to collect surface sample.

(DLS/lcg)

cc: (electronic)
Jalena Dayvault, DOE
Cheri Bahrke, Stoller
Steve Donivan, Stoller
EDD Delivery